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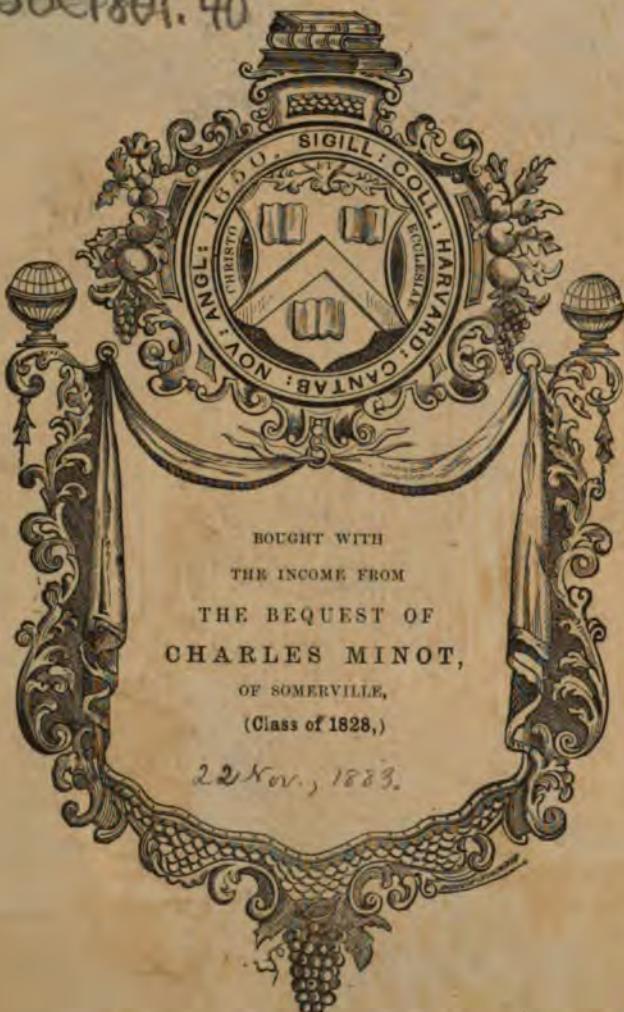
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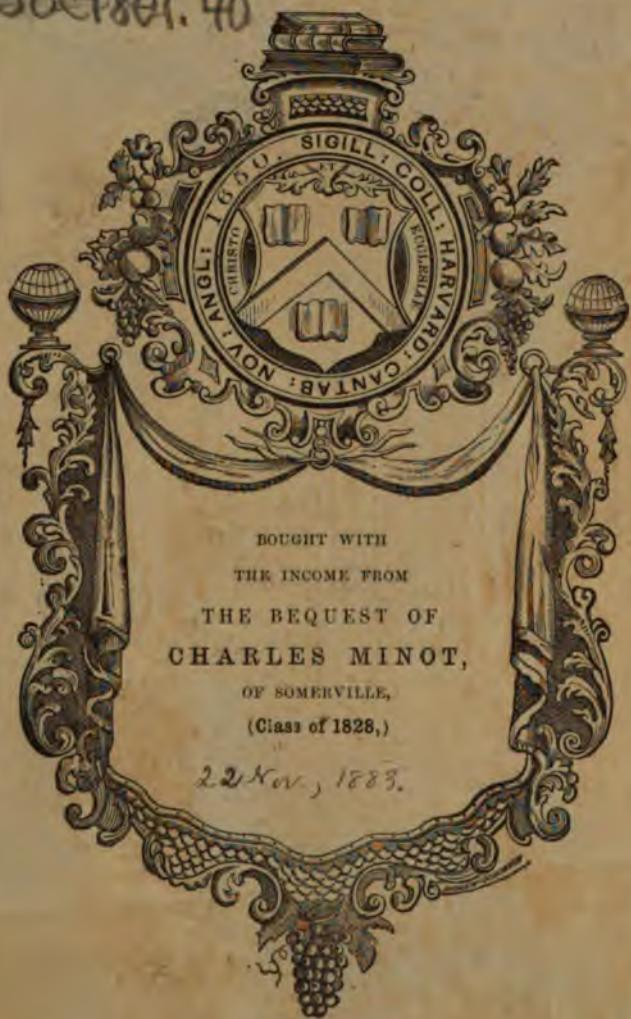


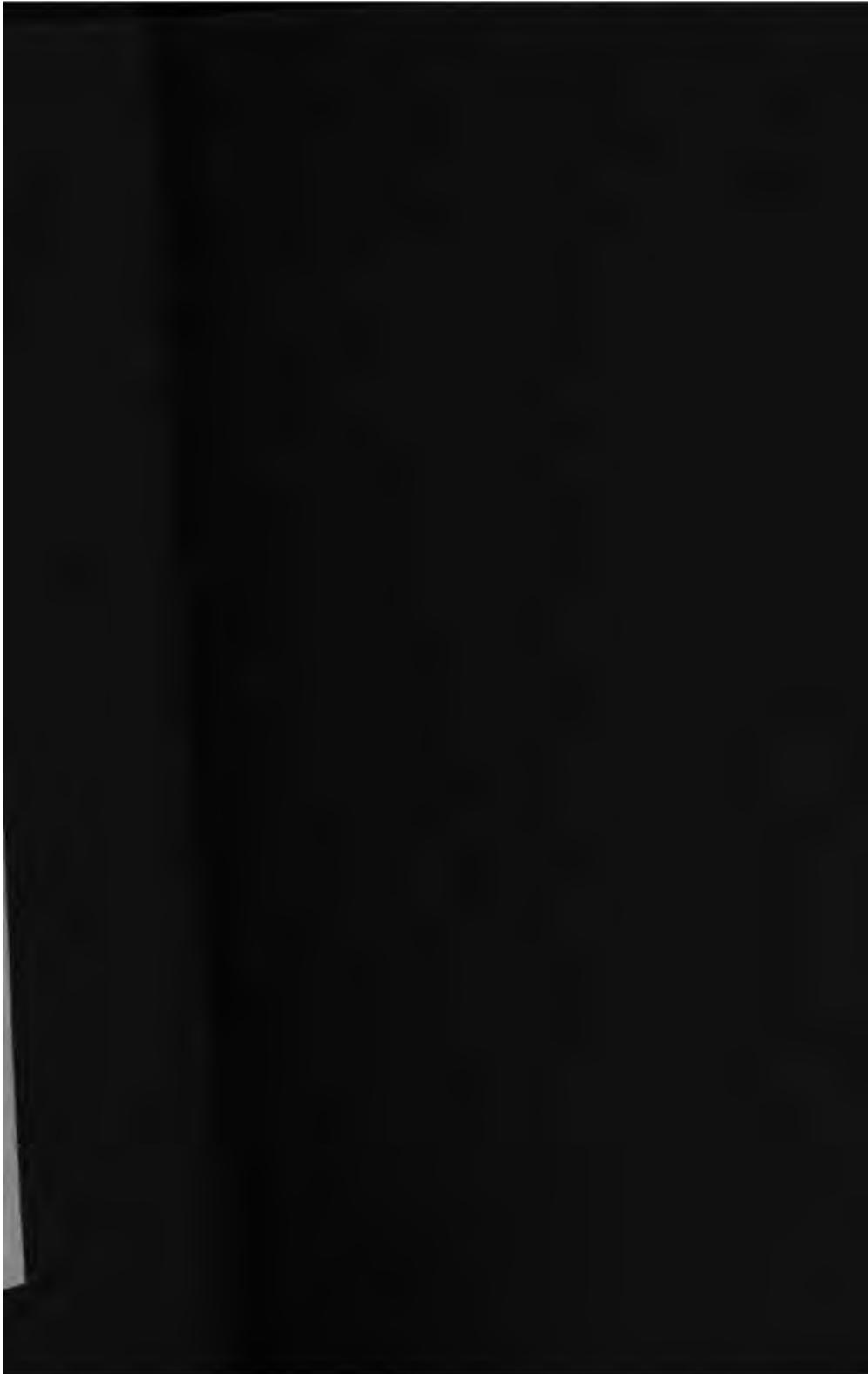
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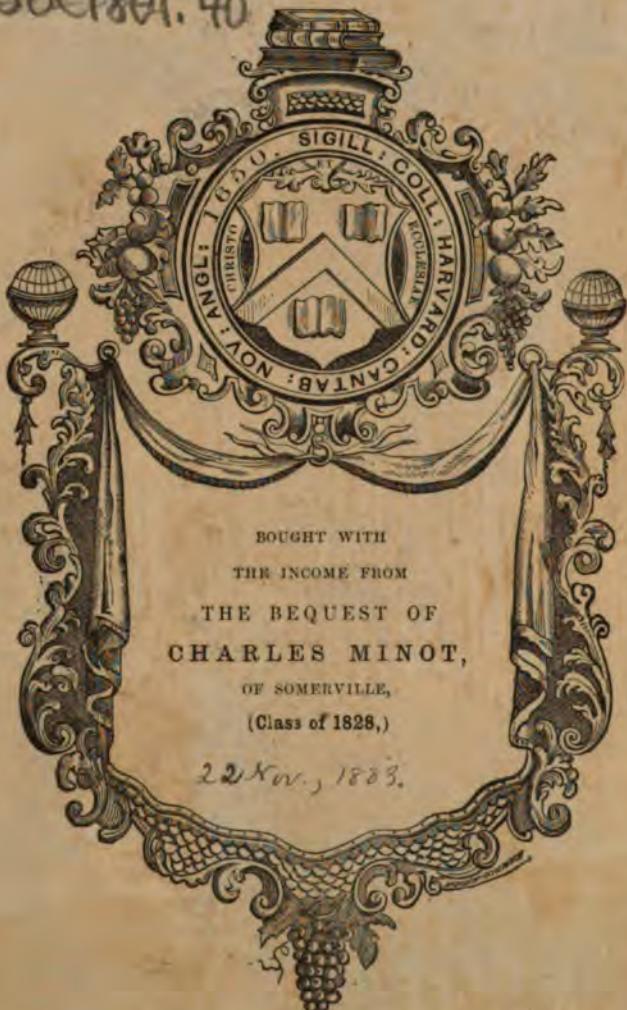


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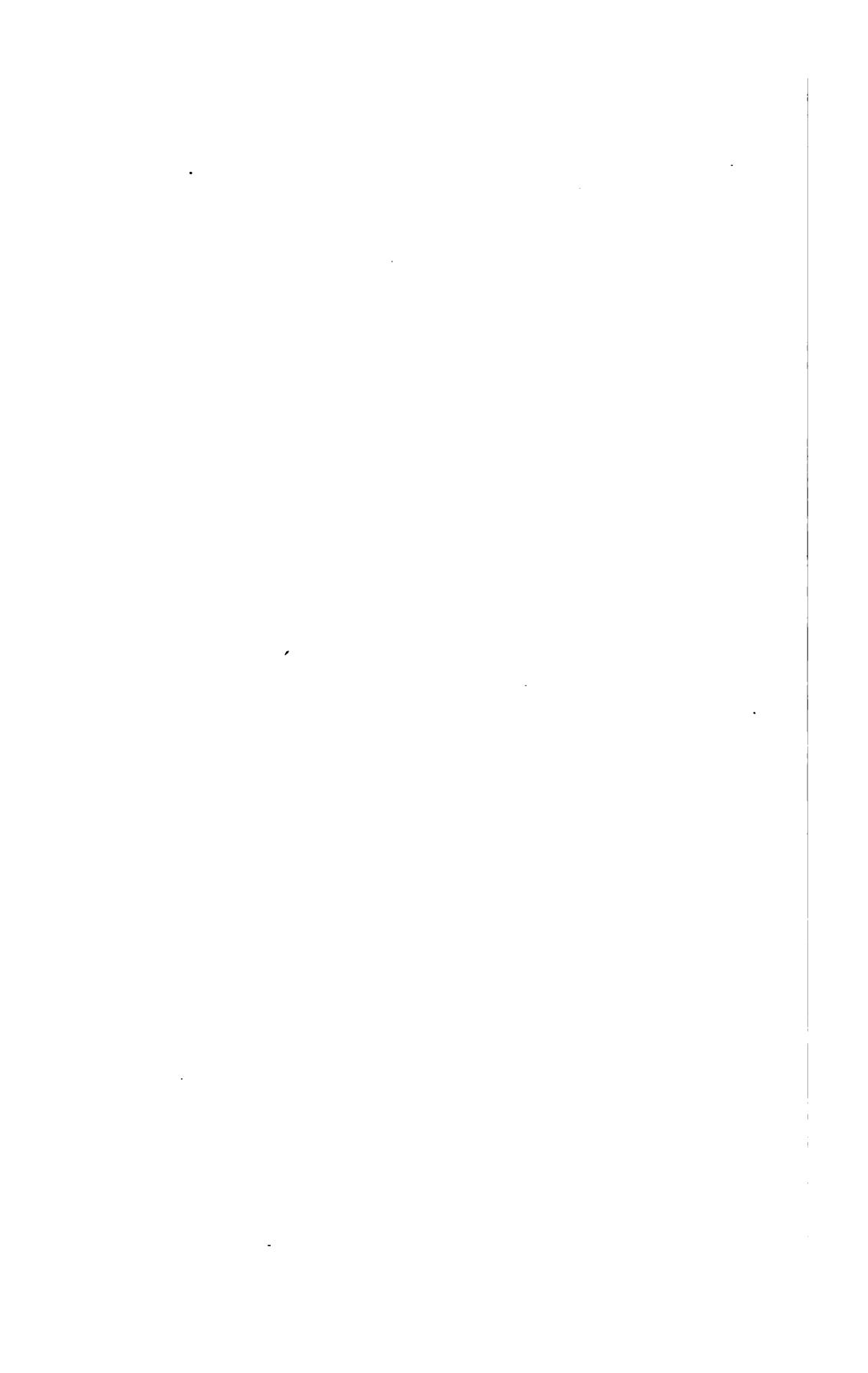




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JOURNAL OF THE TRANSACTIONS
OF
THE VICTORIA INSTITUTE.
—
VOL. XIV.

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OF
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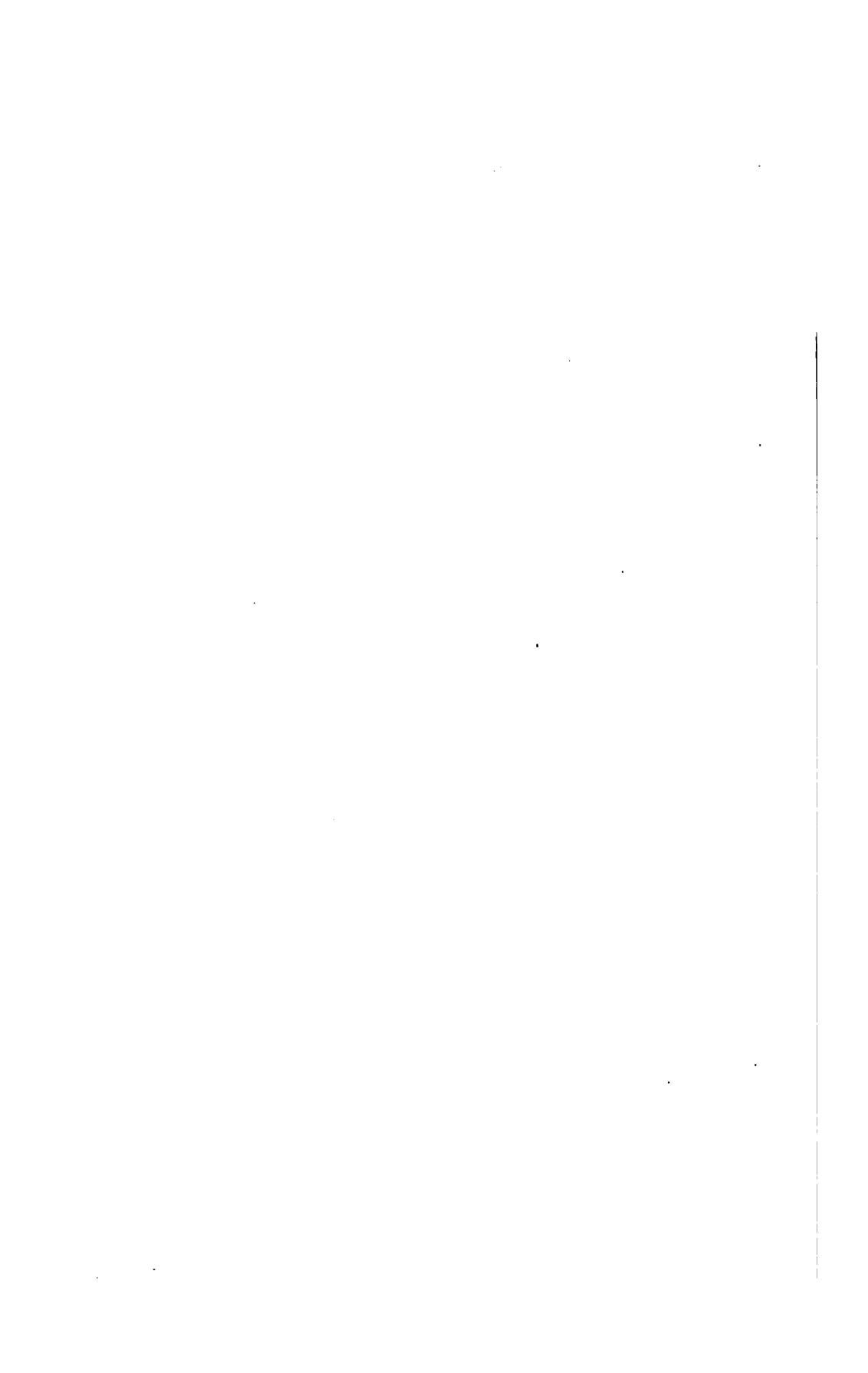
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P R E F A C E.

THE Fourteenth Volume of the *Journal of the Transactions* of the VICTORIA INSTITUTE is now issued. It contains papers by the following authors:—Mr. R. BROWN, F.S.A., whose paper, “On the Religion and Mythology of the Arians of Northern Europe,” forms a companion to his former one on “Archaic Monotheism” (vol. xiii.) ; the Rev. J. FISHER, D.D. ; the Rev. F. W. HOLLAND, M.A., who gives the results of his researches during a journey of over a thousand miles on foot, amid the mountains and valleys of the Sinaitic Peninsula ; Mr. JOHN ELIOT HOWARD, F.R.S., who contributes a careful inquiry into the History and Religion of the Druids ; PROFESSOR T. M'K. HUGHES, M.A. (Woodwardian Professor of Geology at Cambridge), who kindly takes up the subject suggested last year by his Grace the Duke of Argyll, K.G. ; PROFESSOR H. A. NICHOLSON, M.D., F.R.S.E. (Professor of Natural History at St. Andrew's University), whose paper on “Life, and its Physical Basis,” gives the latest results of modern research upon the subject ; PRESIDENT N. PORTER, D.D., Yale, United States ; Mr. HORMUZD RASSAM, who describes the results of his late work at Nineveh and Babylon in such a manner as to render the paper valuable to those who may hereafter follow

in his steps; PROFESSOR G. G. STOKES, M.A., F.R.S. (Lucasian Professor of Mathematics at Cambridge, and Secretary to the Royal Society), one of the foremost scientific men of the present day, who reviews the recent advances of science and shows that the Book of Nature in no way runs counter to the Book of Revelation. The value of such a paper from one so eminent as a scientific layman cannot be too highly esteemed in these days, when scientific knowledge is often boldly claimed as the exclusive possession of those who deny the truths of Revealed Religion, and it is taken for granted that high scientific attainments are incompatible with Christian faith; PROFESSOR H. WACE, M.A. (King's College, London), who deals with Mr. Herbert Spencer's last volume, "The Data of Ethics"; and, the Rev. S. J. WHITMEE, F.L.S., &c., whose paper and map are the result of twenty years' labour amongst the islands of the Pacific, the Ethnology of which he has investigated in such a manner as to make his work of special value.

The new arrangements for securing the greater usefulness of the Journals of Transactions to country and foreign members continue to meet with increased success, and to facilitate the extension of the Institute abroad. Out of upwards of one hundred members who have joined during this year, nearly one-half are resident in America or the Colonies.

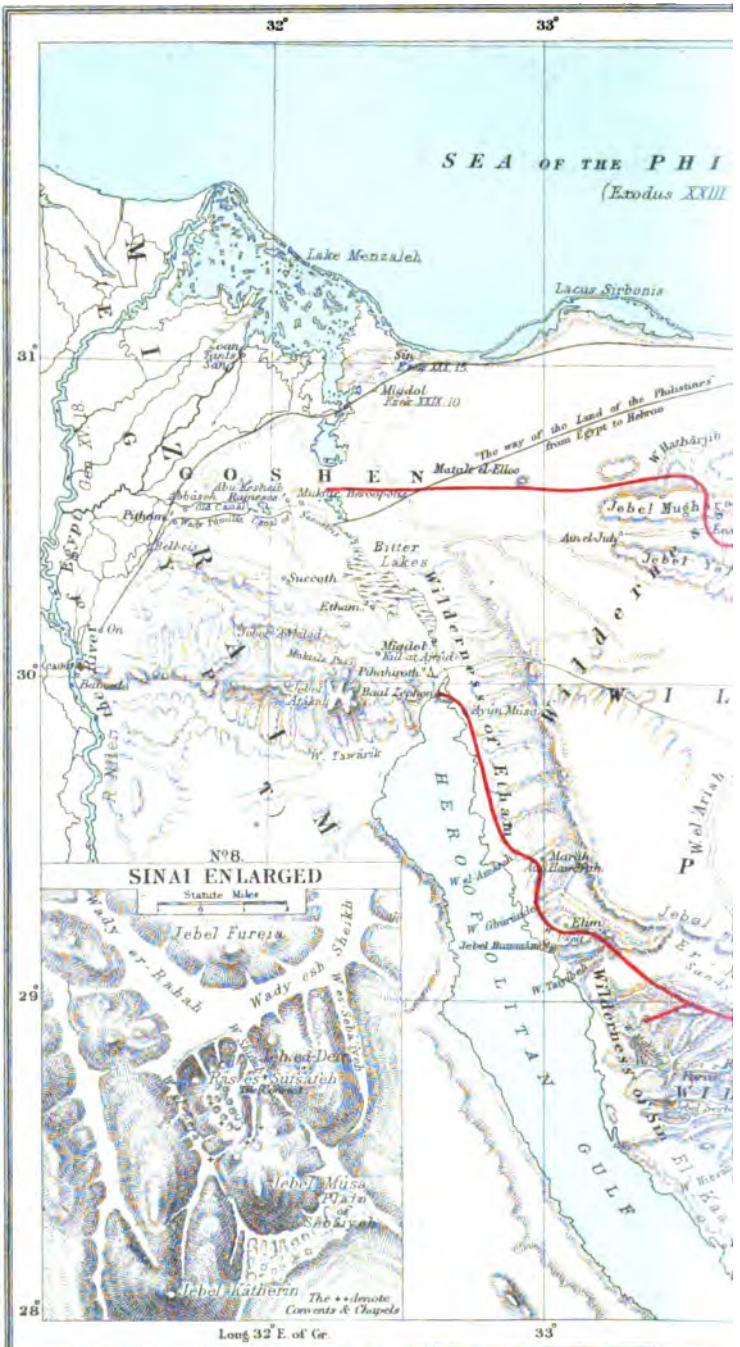
We last year drew attention to Professor Virchow's statement, that any positive advance in the province of prehistoric Anthropology had removed us further from the proof of man's connexion with the rest of the animal kingdom; we now find that a long and careful investigation among the brachiopodes, cephalopodes, and trilobites, made by one

of the Institute's members—the palæontologist Professor JOACHIM BARRANDE—is held by him to show that there is no ground for the theory of the "transmutation of species." These remarks would be incomplete did we not include a reference to the last (1880) meeting of the "Berlin Anthropological Society" at Lisbon, where the lately "discovered evidences of the existence of tertiary man" were held by Professor Virchow, Dr. John Evans, F.R.S., and others, to be wholly unreliable.

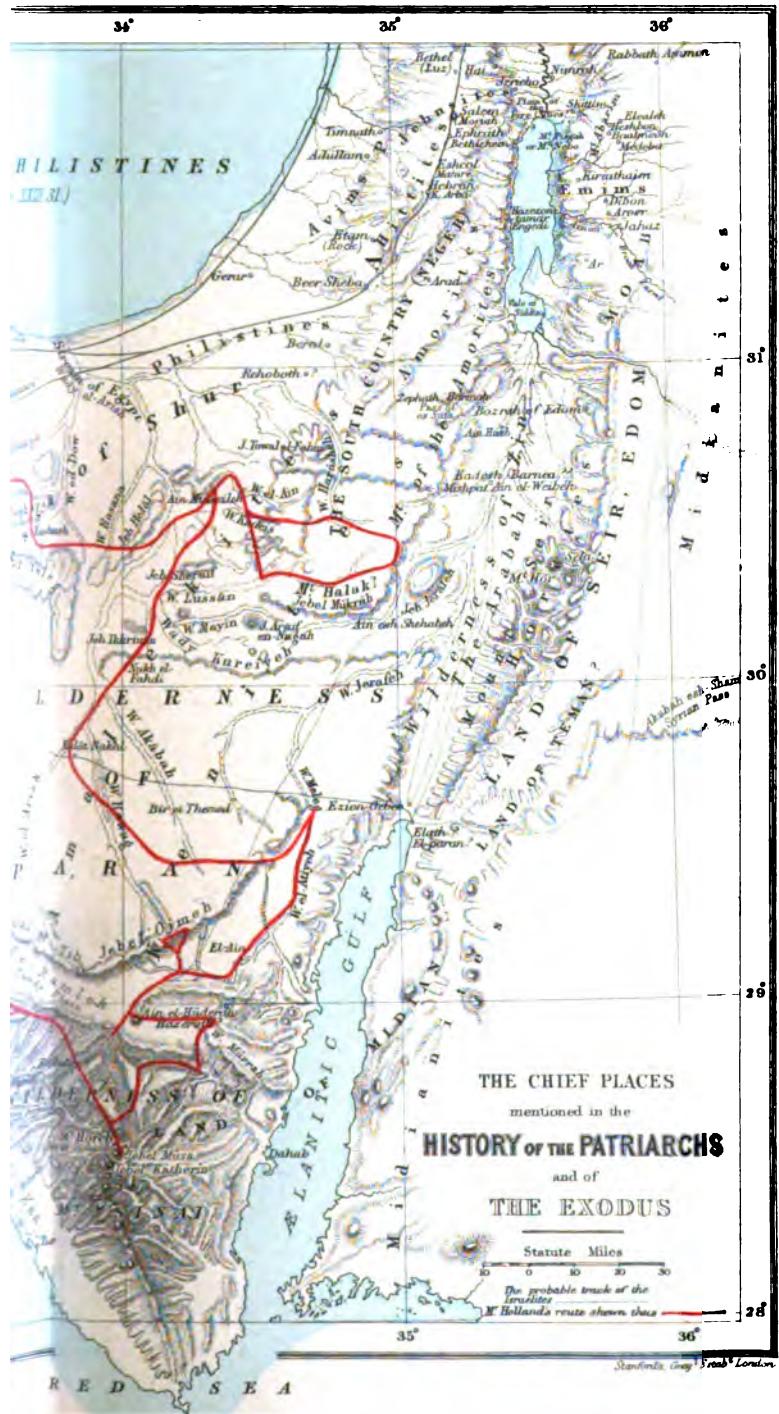
Finally, as regards the labours of men of Science; their value has recently been demonstrated in a special manner by many remarkable discoveries, and it is to be hoped that ere long accurate scientific research, in all its branches, may receive greater encouragement both from the Government and the public.—Truth is only in danger from a want of knowledge.

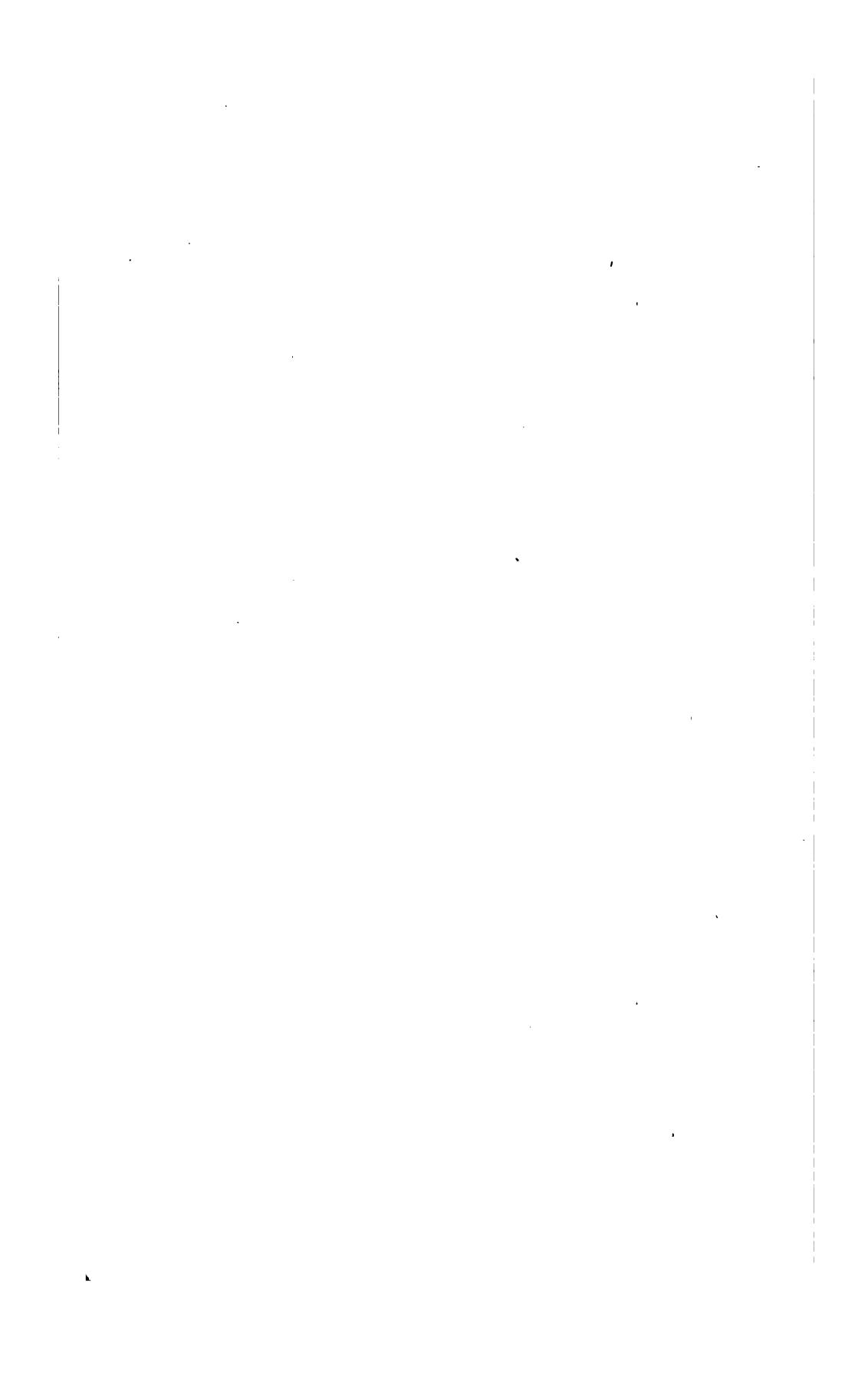
F. PETRIE,
Hon. Sec. and Editor.

31st December, 1880.



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JOURNAL OF THE TRANSACTIONS
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OR
PHILOSOPHICAL SOCIETY OF GREAT BRITAIN.

ORDINARY MEETING, FEBRUARY 17, 1879.

H. CADMAN JONES, ESQ., M.A., IN THE CHAIR.

The minutes of the last meeting were read and confirmed, and the following elections were announced :—

MEMBER :—The Right Reverend J. Barclay, D.D., LL.D., Lord Bishop of Jerusalem.

ASSOCIATES :—Sir John Don Wauchope, Bart., North Britain; the Ven. Archdeacon Kirkby, North America; Rev. T. B. B. Ferris, M.A., York; E. Cutler, Esq., M.D., United States; J. Fortescue, Esq., North America.

Also the presentation of the following Works for the Library :—

“Proceedings of the Royal Geographical Society.”	<i>From the same.</i>
“Proceedings of the Royal Geological Society.”	<i>Ditto.</i>
“Church and State.” By Professor Birks.	<i>Ditto.</i>
“Some Outlines of the History of Philosophy.” By the Ven. Archdeacon Denison.	<i>Ditto.</i>
“Lost Israel.” By Heine.	<i>From C. Biden, Esq.</i>

The following paper was then read by the Author :—

THE TOPOGRAPHY OF THE SINAITIC PENINSULA.

By the Rev. F. W. HOLLAND, M.A. *With a Map showing the Author's Route in 1878.*

I WILL preface my paper by a few remarks on my own travels in the Peninsula, in order that you may weigh my claim to express an opinion upon the interesting questions connected with its topography.

My first visit was made in 1861, when I travelled in the usual way, under the direction of a dragoman, who was very ignorant of the country, and very much afraid of the Arabs; and I returned home feeling that, although I had seen much more of the Peninsula than most travellers see, I really knew very little about it. But I felt the truth of the Dean of Westminster's remark in his excellent work on "Sinai and Palestine" (p. 33), that the determination of the questions relating to the route of the Israelites had been obscured, first by the tendency of every traveller to make the Israelites follow his own track, and secondly, by the impossibility of instituting a just comparison between the facilities and the difficulties of the various routes, until some one person had explored the whole Peninsula, and I determined that if no one else was in the field I would endeavour to do this. In 1864 an opportunity offered itself; and, accompanied by two friends but without a dragoman, I made a walking tour through the Peninsula, but again returned grieved to find it still remaining to a very great extent an unknown land.

In 1867 I went out for the third time, and lived alone with the Arabs for four months, and succeeded in exploring carefully the greater portion of the Peninsula, and in making a map of it, which was published by the Royal Geographical Society.

In the following year I returned as guide to the Ordnance Survey expedition, and again spent several months in the country; and in the spring of last year I paid it my fifth visit, travelling on foot and alone as in 1867, i.e. with three Arabs, whose camels carried my provisions for two months, tent, and other necessaries; and, following the route marked in the map which hangs before you, I traversed a large portion of country that had hitherto remained unexplored, and I hope succeeded in throwing some additional light upon the probable position of Kadesh Barnea and the journeyings of the Children of Israel thither from Mount Sinai. I shall now describe to you what I have myself seen, and the opinions which I have

formed, after a careful study on the spot, of the bearing of the topography on the history of the Exodus.

The Sinaitic Peninsula, strictly speaking, includes that wedge-shaped desert region which is bounded on the west by the Gulf of Suez, and on the east by the Gulf of Akaba, the two gulfs being respectively 186 and 133 miles long.

The Hadj, or Mecca Pilgrim road, which runs eastward from Suez to Akaba, marks its northern boundary; but I shall take you this evening some 80 miles further north to Jebel Mugrâh, across the desert of the Tîh, or "Wanderings." This desert, the drainage of which runs northwards towards the Mediterranean Sea on the north-west, and the Wady el Arabah and Dead Sea on the east, forms an elevated plateau of limestone, terminating on the south in a long range of cliffs, Jebel et Tîh, which also projects in the form of a wedge into the Peninsula, the southernmost portion being called Jebel el Ejmeh.

The region south of Jebel et Tîh is in the main a mountainous desert.

The popular idea of a desert is a flat expanse of sand. Nothing, however, could be more unlike the desert of Sinai, where sand in any quantity is very seldom seen, the Debbet er Ramleh, or "plain of sand," north of Sarabit el Khadim, and the sandy plains near Ain Hudherah being the exceptions. The greater part of the mountains consist of crystalline rocks, chiefly syenite. These rise to their greatest elevation in the neighbourhood of Jebel Musa, in the centre of the Peninsula, the highest peak being that of Jebel Katharina, which rises to an altitude of 8,550 feet above the sea-level. Jebel Musa is 1,175 feet lower, being only 7,375 feet.

With the exception of the large plain of el Gaah, on the west, and the smaller plains on the shore of the Gulf of Akaba, the whole of the southern portion of the Peninsula consists of irregular ranges of syenitic mountains. On the north-east and north-west are extensions from the central nucleus of the same crystalline rocks projecting upwards like two horns, nearly parallel to the coast-line of the gulfs on either side. To the north of these a wide irregular band of metamorphic rocks extends almost across the Peninsula; between which and the cretaceous limestone of Jebel et Tîh lies a breadth of red sandstone, of carboniferous age. The shore plains which fringe nearly the whole of the coast consist of desert drift and alluvium, with some remarkable raised beaches and tertiary deposits. A line drawn northwards from Ras Muhammed, the southernmost point of the Peninsula, past Jebel Musa to Jebel el Ejmeh, marks the central watershed; and from this

on either side the drainage flows east and west, cutting its way deeper and deeper through the mountain-ranges until the gulfs are reached, sometimes, as in the case of Wady Feiran, which the Serbal range pushes northwards, by a very circuitous route.

These wadies, or watercourses, in consequence of the mountainous character of the country, form the only roads through it. They are generally dry torrent-beds, their breadth and character differing according to the nature of the surrounding rocks and the rapidity of their descent. Some few are as level and hard as a high road, but the majority afford very rough walking amidst loose rocks and boulders. A remarkable feature along the coast is the existence of a promontory in almost every case at the mouth of the larger wadies. At the outfall of a river is usually found a bay; but the wadies of Sinai are only filled with water after a storm, and the torrents which then flow down them deposit a large amount of débris, which gradually assumes the form of a promontory.

The general aspect of the country is one of extreme barrenness and desolation; but it has a beauty and grandeur of its own which cannot fail to captivate the traveller. The variety of colouring is very great, and the evening and morning effects are most striking. The white limestone mountains, dazzling and trying as they are under a midday sun, melt into exquisite shades of purple as the sun goes down. The warmer tints of the brown and red sandstone glow with rich hues of colour; but it is in the granitic district that the full beauty of the desert is seen. There the wildness of the scenery and the varied forms of the mountains, streaked with dykes of purple and black, and displaying a brightness of colouring, red, white, rose, and green, which fully compensates for the lack of vegetation, exceeds the power of description; and the impressiveness of the scene is heightened by the deathlike stillness which reigns around, and by the absence of any signs of life.

The excessive dryness of the atmosphere causes a remarkable clearness, which enables the eye to see objects at a very great distance, but at the same time renders it exceedingly difficult to estimate distances.

The range of temperature is very great in the higher districts during the winter months. On 13th November, 1867, at a height of about 5,000 feet above the sea-level, my thermometer at 6.30 a.m. stood at 17° Fahr., and at midday in the sun at 120°. In December, 1868, at the camp of the Survey expedition, close to St. Katharine's monastery, at an altitude of

4,854 feet, the thermometer ranged from about 22° at night to 70° in the shade by day. The higher mountains are frequently covered with snow. The Bedawin suffer severely from the cold, and in the winter move down to the lower districts. The ibex appear to do the same, and large herds may at such times be seen in the neighbourhood of Jebel Serbal.

The summer temperature is very oppressive on the shore plains, and fever is common in the marshy ground about Tor, but on the mountains the air is always fresh and invigorating, and the climate exceedingly healthy.

The Israelites coming from the warm climate of Goshen must have felt the cold acutely in the Sinai mountains, and it is remarkable that the Bible makes no reference to it, except, perhaps, the command in Exodus xxii. 26, "That if thou at all take thy neighbour's raiment to pledge, thou shalt deliver it unto him by that the sun goeth down."

The Bedawin Arabs, who inhabit the southern portion of the Peninsula, belong to the tribe of the Towarah, and are said to number about 4,000, not including the women and children. They are gentle and courteous in manners, and strictly honest, theft and fraud being almost unknown amongst them. Of course, if a traveller should attempt to pass through their country with a high hand, despising their customs, and not placing himself under the protection of one of their sheikhs, he would probably very soon be stripped of everything, even to his clothes; but once under a sheikh's protection one's property is absolutely safe. Their means of livelihood are scanty, and they depend upon Egypt for their supply of corn. A few of the sheikhs possess negro slaves, who are always kindly treated. The Arabs live in tents made of goat's-hair cloth, woven by the women, but the encampments are always small, seldom consisting of more than six or eight tents. The scantiness of the pasturage makes it necessary for them to break up into small bodies. Like all Bedawin, they are not continually on the march, but their movements are regulated by the supply of pasturage for their camels and flocks of sheep and goats. In the same way was regulated, I suppose, the stay of the Children of Israel at their different camping stations, when, after leaving Kadesh, they wandered for forty years in the wilderness, and their life then must have closely resembled that of the modern Bedawin. It is interesting to trace out the points of resemblance. The rude looms used by the women in making their tent-cloth remind us how "all the women of Israel whose heart stirred them up in wisdom spun goat's hair" for the curtains of the tabernacle (Exodus xxxv. 26): the primitive millstones with which they grind their corn are doubtless

similar to those with which the Israelites used to grind their manna. Great festivals are held, at which sheep and goats are sacrificed and eaten, and the blood may be seen poured out at the tomb of their saints, or struck upon the lintel and door-posts of their shrines ; the marriage rites, the law of restitution in cases of theft, the lawful killing of a slayer by the "revenger of blood," are almost identical with the laws and customs appointed by Moses.

There can be little doubt also that the present natural features of the Peninsula are almost the same as they were at the time of the Exodus. The mountains and wadies remain unchanged. This can be proved. At Wady Mugharah and Sarabit el Khadim, in the sandstone district, are found numerous tablets of Egyptian hieroglyphics and inscribed stelæ, in connection with the ancient turquoise-mines, which the inscriptions state were worked by the kings of Egypt who lived before the time of the Exodus.

The inscriptions are in most cases as sharp and fresh as on the day they were executed, which prove that the thousands of years which have elapsed can have had little or no effect upon the sandstone ; much less upon the harder and more compact limestone and crystalline rocks of which the Peninsula is mainly composed.

The conclusion thus arrived at is further confirmed by the fact that the position of the Sinaitic inscriptions, which are scattered over a large area of the Peninsula, not only in the wadies, but also on the sides and summits of the mountains, clearly proves that no great change has taken place since they were made, probably nearly 2,000 years ago.

At the same time there can be little doubt that the amount of vegetation has considerably decreased. Large tracts of the northern portion of the Tih plateau, which are now desert, were formerly under cultivation, and the Isthmus of Suez, under the influence of the maritime and freshwater canals, is only now regaining its former fertility. Such changes in the character of the surrounding country must, to some extent at least, have influenced the dews and rainfall of the Peninsula of Sinai. I am watching now with interest to see what effect the refilling of the Bitter Lakes and the introduction of freshwater irrigation in the Isthmus will have upon the climate of Suez.

Probably also the Peninsula itself contained formerly a far larger number of trees. For many years the Arabs have been burning them for charcoal, which they carry to Egypt and exchange for corn ; and the smelting of ores in olden times, of which extensive traces remain, must have caused a considerable

demolition of trees. With regard to the smaller shrubs and pasturage, these are far more abundant, even at the present time, than is generally supposed, and a slight addition to the rainfall would increase them enormously.

It is wonderful to see the effect produced in a few days by a little rain : grass and flowers spring up on all sides, and the parched and withered herbage of the desert quickly forms a carpet of green, whilst the mountain crannies and basins produce an abundance of succulent herbs.

It is a great mistake to suppose that the monastic gardens at Jebel Musa and Tor, and the Wady Feiran, mark the only spots where any considerable amount of cultivation could exist in the Peninsula. Hundreds of old monastic gardens are scattered over the mountains, and there are occasional traces of terraces for the growth of corn.

Now when rain falls it rushes headlong to the sea, carrying all before it ; but the monks, and possibly the Amalekites before them, placed rows of stones across the gullies, which checked the flow of the water, and caused deposits of earth, which were carefully planted, and the water filtering from one to the other added to the fertility of the country, instead of destroying it.

Its capabilities for supporting life, vastly underrated at present, were probably in ancient times considerably greater, and the water-supply in the granitic district at least is even now tolerably abundant, and many a refreshing swim have I had in clear deep pools, fringed with maiden-hair fern.

In endeavouring to trace the route of the Israelites a difficulty meets one at the outset. Where was Rameses, their starting-point ? Brugsch Bey identifies it with Tanis, or San, on the evidence afforded by inscriptions and papyri. But if there, the Israelites would have had to cross the Pelusiac, or eastern branch of the Nile, an undertaking which the history of the Exodus, short as it is, would hardly have passed over in silence. Dr. Beke's theory, that the Land of Goshen was situated to the east of the Isthmus of Suez, has nothing in its favour, except that it brings Goshen nearer to the Gulf of Akaba, which he believed to be the "Red Sea" of the Exodus. That district, however, certainly never had any rivers to supply the fish, which lived in the Israelites' memory as one of the luxuries of Egypt.

Others would place Rameses at Wady Tumeilat, near the present freshwater canal between Zagazig and Ismailia. At all events, the general position of the Land of Goshen on the extreme north-east of Egypt, and corresponding with the modern province of Es Shurkiyeh, appears to be satisfactorily

settled. Brugsch Bey has propounded an ingenious theory that the Israelites leaving Egypt by El Kantara marched north-eastwards to the Serbonian Lake, which he identifies with the Yam Suph, or Red Sea; and that it was here that Pharaoh's host was overthrown. Dr. Byrch, however, does not consider that he has succeeded in substantiating this theory from the ancient Egyptian records, and it is in no way commended by geographical considerations. That the Israelites should have marched so far northwards, and then have doubled back to the Bitter Lakes, where Brugsch Bey would place Marah, and to the Gulf of Suez, appears a most unnatural proceeding, and difficult to fit in with the Bible history. The location of Succoth depends largely upon the position of Rameses; Etham, we are told, was "in the edge of the wilderness" (Exodus xiii. 20), and should therefore be looked for somewhere on the line of the Suez Canal, either at Ismailia, or, as appears to me more probable, immediately to the north or south of the Bitter Lakes. If at the time of the Exodus those lakes formed the head of the Gulf of Suez, the latter position is out of the question; but this is a point which needs further examination.

The passage through the Red Sea probably took place not far from Suez, and then the Children of Israel entered the Wilderness of Etham, or Shur. The latter name, which means "a wall," it has been suggested, was derived from the wall-like appearance of the range of Jebel er Râhâh, which bounded it on the east.

Ayun Mûsa, the wells of Moses, lie about eight miles down the coast, and here perhaps the Israelites encamped after the passage; but the Bible makes no mention of this.

They must next have travelled down the broad plain that lies between the sea and Jebel er Râhâh, now, as then, a journey of three days at the average rate of marching of a large army, and without water. This would bring them to a district near Ain Howarah, where the ground is impregnated with natron, and the water is bitter and unwholesome. Here were the Waters of Marah.

A few miles to the south, the range of Jebel Hammam, which touches the sea, would compel them to turn inland, and Elim may be placed in the plains which lie to the north-east of that mountain, where there are still palm-trees and a supply of water. "The encampment by the sea," mentioned in Numbers xxxiii. 10, appears to prove that, descending Wady Taiyibeh, they regained the coast, and then they *must* have marched on to the plain of El Markha, which may have been the Wilderness of Sin (the alternative northern route, by the Debbet er

Ramleh, is placed on one side directly we descend Wady Taiyibeh to the sea). Between this and Rephidim were the stations of Dophkah and Alush (Numbers xxxiii. 12, 13). The former has been identified with some probability with Mafka, the name given to the sandstone district in which the turquoise-mines were worked. The only possible road from El Markha would lead past this district and up the well-known Wady Feiran, which still forms the great highroad through this portion of the desert, and leads up to Wady es Sheikh, and so to Jebel Mûsa. But where must we place Rephidim, the scene of the battle between the Israelites and Amalekites? Major Wilson and Major Palmer, following Dean Stanley, place it at El Hesweh, in Wady Feiran; but I have ventured to differ from them, though this is the only point on which we do differ. We are thoroughly at one with regard to the Israelites' route. It is argued in favour of Wady Feiran as the site of Rephidim, that it is impossible to believe that the Amalekites would have yielded up without a struggle that fair oasis, with its fertile groves and running stream, which must have been their most highly-prized possession in the Peninsula; and also that tradition and strategical considerations support that site.

But there is nothing to prove that the gardens of Wady Feiran existed before monastic times; and the running stream which Major Palmer saw had not existed one year: I saw it made myself by a great storm in the previous year. After less than two hours' rain one evening a great flood descended from the mountains, and in the morning the whole aspect of the valley was changed. A thick tamarisk-wood, two miles in length, had utterly disappeared; hundreds of palm-trees were washed away; the bed of the wady was raised several feet in some places, and lowered in others; and the present stream had taken the place of a raised bank.

It is true that there was before a stream, though not a perennial one, a little higher up the valley; and from its configuration it is probable that there always has been water here near the surface; for every large wady forms, in fact, a stone drain, and when rocks interpose, and come near the surface, then water appears; but the stream in Wady Feiran cannot be accepted as a proof that it was a prized possession of the Amalekites.

There is also nothing to prove that the tradition connected with El Hesweh is not of monkish origin, as the greater number of Sinaitic traditions certainly are.

With regard to strategical considerations, it appears to me that they are in favour of the pass of El Watiyah in Wady es Sheikh as the site of Rephidim.

Here a remarkable line of precipitous mountains forms the northern boundary of a district called El Jibâl by the Arabs. This district comprises the high central group of mountains which cluster round Jebel Mûsa ; and which I believe to have borne at the time of the Exodus the name of Horeb. It seems very probable that the Amalekites should have retired before the advancing hosts of Israel to this natural fortress, and that they should have determined to concentrate all their forces in making one great stand against their invaders at this spot.

El Watiyeh affords the only possible pass by which waggons could enter this district ; and being only about 40 yards broad and 400 long, and flanked on either side by precipitous cliffs, it would form a strong point of defence. It is, moreover, only one day's march from Jebel Mûsa, which agrees better with the Bible narrative than the proposed site in Wady Feiran, which is three days distant. The rock at Rephidim, which, when stricken by Moses, supplied the Israelites with water, is described as being in Horeb, and this would be strictly true if El Watiyeh be Rephidim, and the district of El Jibâl be Horeb.

I have spoken of Jebel Mûsa as Mount Sinai, and the Ordnance Survey of the country has, I believe, proved this without a doubt. There is no other mountain in the Peninsula that answers all the requirements of the sacred history ; in this we find a mountain standing apart from others, so that bounds could be placed round it ; rising abruptly from its base, so that people might come near and stand beneath it, and might even touch it, if permitted ; and having before it a large open space, the Wady er Râhâr, on which the whole congregation of Israel might assemble and come near, or move afar off, without losing sight of its northern peak, the Ras Sufsafeh, which must have been that from which the Law was given. There is also a larger supply of water and pastureage in the neighbourhood of Jebel Mûsa than in any other part of the Peninsula.

I have not time to say much about the route of the Israelites from Mount Sinai to Kadesh. I am convinced that they did not follow that usually laid down for them to the Gulf of Akaba by Ain el Huthera. The wadies along that route are confined and winding, and impassable for waggons, six of which, we are told, had been presented by the princes at Mount Sinai for the service of the tabernacle.

I spent some weeks last spring in tracing out and exploring all the available roads and passes, and have come to the conclusion that they probably marched direct northwards from Jebel Mûsa, and ascended to the Tîh plateau by Wady Zelleger

and Wady Atiyeh. These afford an excellent road, and the ascent to the Tih plateau is so gradual that no difficulty is met with. The Pass of Nakb Mirâd, discovered by Professor Palmer, is by no means an easy one.

Having once mounted to the level of the Tih desert, a gradual descent across a succession of large open plains, with abundance of pasture, would lie before them, and they would reach Jebel Mugrah without any trouble. Here we must place Kadesh Barnea, but whether at the south-eastern point near the head of Wady Garaiyeh, where there is a road running northwards, or on the western side at Ain Kadeis, further exploration must determine.

The name of the latter place is a strong point in its favour, and there is abundance of water and vegetation in its neighbourhood, and many traces of ancient habitations. I had hoped that I should have been able to settle this point last year, but the disturbed state of the country, owing to constant raids of the Arabs from the east of the Arabah, and the excessive drought, prevented my exploring the southern face of Jebel Mugrah; when this has been done, this important question will, I trust, be set at rest; and here, and in the exploration of the whole of the Negeb, or "south country" of the Bible, remains much interesting work for future explorers.

The CHAIRMAN, in conveying the thanks of the meeting to the author of the paper, said it showed that Mr. Holland had such a personal knowledge of the subject as was seldom met with. (Cheers.)

Mr. A. V. NEWTON asked:—Were they to infer that there were no indications existing of the Israelites in the Sinaitic Peninsula, either as records on rocks or otherwise?

Rev. F. W. HOLLAND said:—He did not think there were any records on the rocks. The Sinaitic inscriptions certainly had nothing whatever to do with the Israelites, and although there were one or two inscriptions which appeared to be older than those ordinarily met with, he thought they were not nearly as old as the time of the Exodus. It was exceedingly difficult to judge of the date of the inscriptions, and very great mistakes had been made about them. In the case of an inscription which contained the words, "**ΙΩΑΣΑΦ ΜΟΝΑΧΟΣ**," one writer was of opinion that the monks of old had written it, but Major Macdonald had told him that he knew the monk who had written this. (Laughter.) He himself had made inscriptions, and from a little distance had not been able to tell which were his, from the colouring. The inscriptions on the granite were made by bruising the dark colouring of the rocks by means of stones; those on the sandstone were

mostly cut with flakes of flint. As regarded other remains of the Children of Israel, he thought there must be some. He did not think they could possibly have remained so long in the country without leaving some traces, at least in their tombs. But who was to say what was, and what was not, an Israelitish tomb? There were some exceedingly interesting primitive buildings, and these were, he believed, the remains of the dwellings of the Amalekites, certainly as old as the time of Israel; and very probably the tombs of the Israelites would be similar to those of the Amalekites. It was difficult in that country to dig a grave, and therefore the inhabitants had been in the habit of making a ring of stones, placing the dead within the ring, putting earth over the bodies, and placing heavier stones on the top. The Children of Israel, when encamped before Mount Sinai, would have their burying-place at some little distance; and just over the pass of Nukb Howa there was a large ring of stones which went by the name of "The Convent of Moses." This ring was about 112 yards in diameter, and he could not help thinking that it was a burying-place of the Children of Israel. There was, however, nothing whatever to prove it, although he thought it a very probable place for the burying of the dead,—just the position the Israelites would have chosen.

Other questions having been asked,—

Mr. HOLLAND said:—There had been an Egyptian garrison at the turquoise and copper mines at Wady Mugharah and Serabit El Kadim. He was, however, of opinion that the garrison would not have been large enough to keep back the Israelites. He thought that the strong point against the northern route was the encampment by the sea. He hardly thought that a small number of Egyptian soldiers stationed, as a guard over the miners, at the turquoise mines would have dared to have opposed the host of Israel. Last spring he had taken pains to ascertain the connection between the northern and southern routes, and he found that there were a large number of valleys through which communication could take place. There was a plain to the south of Jebel Musa, but it was at a considerable distance from the mountain, and he did not think that this plain at all came up to the probable requirements for the camping-place of the Israelites. The only other plain that at all answered to these requirements was that of "Senned;" but he did not think, taking all things into consideration, that it was as suitable for the encampment as the one before Jebel Musa. Serbal seemed to him entirely out of the question. The supposed plain before Serbal did not exist at all. The mountain was a very imposing one, far more so than the others, although not nearly as high. He had been all over the peninsula, and had walked some 5,000 miles in different directions, and certainly there was no plain that at all came up to the requirements in the same way as Jebel Musa.

Mr. D. HOWARD said, that a point in the lecture to be specially observed was the existence of a state of much greater fertility in the Sinaitic Peninsula than was usually supposed. It was a matter for careful examination as to

how far the climatic changes were governed by the state of vegetation. It undoubtedly was the fact that the climate of northern Egypt had been changed for the worse on account of the planting of trees, and such an amount of wet weather had been experienced as appeared to be actually unknown in previous times. Nothing was more evident than that the same cause would work in the opposite direction, and that the excessive destruction of trees would reduce the desert of Sinai to the comparative state of barrenness now found. Of course the conditions of life under which an Arab could thrive were not those which would appear very promising, but it was interesting to find that even now there was a possibility of sustenance for large flocks and herds in what was usually supposed to be a desert. The fact of there being a large amount of herbage was certainly a surprise.

The Right Rev. BISHOP PERRY having asked a question,

Mr. HOLLAND said :—The population of the Peninsula was considered to be 4,000 men, besides women and children. He saw no reliable traces of the Israelites after their departure from Mount Sinai. Throughout the northern desert there were primitive dwellings and burying-places. These *might* be Israelitic remains; but it was impossible to say whether they really were or not. He had intended to go north to Kadesh but had been prevented, and he therefore had struck out to the west. In the country he thus passed through he found a large number of primitive dwellings. After passing Nakhl he came to large tracts of soil ploughed up now by the Arabs for corn. This was done by making a camel drag a stick through the soil—that was all that was required. When the rainy season arrived they planted it. Maize and beans were grown here. Much soil had been obtained in many spots by placing large stones in the watercourses, which arrested the débris brought down by the water. In some instances these stones were very large. He was struck by a remark of one of the Arabs with him. Pointing to a row of these stones he (the Arab) said, “There were giants in those days.” Still farther north he had seen on former occasions a large number of heaps of stones, which Professor Palmer found were connected in the Arabs’ minds with traditions of vineyards. Nobody who had not wandered about on foot over these mountains had any idea of the large amount of vegetation and the good supply of water there really was. He formed a perfectly different idea of the country after wandering about it on foot to that which he had formed when passing through as travellers generally do.

In reply to further questions—

Mr. HOLLAND said :—The Sinaitic inscriptions were very much more numerous than was commonly supposed. He found them in all parts of the Peninsula. He was employed during the Ordnance Survey in making copies of them, and copied between two and three thousand, and of course he did not copy nearly all in the Peninsula. There was, he thought, sufficient data to prove that they were not earlier in date than two centuries before Christ, or later than two centuries after Christ. All authorities were now

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agreed that they were made between these two dates. There were twelve bi-lingual inscriptions. The one of which a drawing was exhibited in the room was the most clear. The figure of a man in that was supposed by Mr. Foster to be Moses with his hands up in the attitude of prayer. The Sinaitic inscription he read as an account of the battle of Rephidim. In the mule at the bottom he saw a type of obstinate Israel. The Greek he declared to have nothing whatever to do with the Sinaitic. He would, however, call attention to the fact that it was bracketed with it. Besides this, it was one of the few inscriptions made with a metal chisel, and the width of all the letters corresponded with the width of the chisel. The inscriptions were found as a rule on the natural face of the rock. In one or two cases advantage had been taken of tablets prepared for Egyptian inscriptions, but in no instance had the rock been prepared for the Sinaitic inscriptions. The Arabs of the present day made somewhat similar drawings on the rocks in charcoal. The old inscriptions were exceedingly interesting, as representing the character of the people who wrote them. For instance, in the picture in the room there was a man out hunting with a dog ; and just above that a man in the act of killing a wild goat with something like a hatchet. Then there was a representation of laden camels. There was also a man on horseback throwing a javelin at a target, and a picture of an ostrich. There were several cases where a man had begun to write his name in Greek, but not being able to manage it had given it up and taken to Sinaitic. He did not think there was anything in the Bible to imply that the battle of Rephidim took place in a plain. Just to the north of the pass, where he supposed the battle to have commenced, was a remarkable hill which commanded a clear view of the whole, and this appeared to him to be the hill on which Moses took his stand. Just at the bend of the pass was a rock called by the Arabs, "The Seat of the Prophet." He asked the Arabs whether they meant "The seat of Mahomet" by this. They answered, "No, the seat of our lord Moses." They poured milk over it as an offering, and stuck little sprigs of grass into the crannies of the rock. He did not attach much importance to the traditions found there, as there was everything against a line of unbroken tradition. He had not formed any opinion as to the point at which the Israelites crossed the Red Sea. The country required very careful examination in order to ascertain whether at the time of the Exodus the Gulf of Suez extended to the Bitter Lakes, or was only connected by a canal. There were to be found traces of human habitation round the Bitter Lakes. He might add that he had found a most interesting road from Ismailia to Jebel Mugrah, along which were fortified walls, dwellings, and buildings of Roman date. There were also great numbers of flint implements. This must have been the high road leading from Edom direct to Egypt, and, he thought, the one followed by Abraham and Lot when they went down into Egypt. He thought the flint implements on the table were made in the time of Moses, but the Arabs of the present day occasionally made them. He should not like to say where Rameses was.

Mr. CRACE said, that when the cuttings were being made for the Suez Canal he rode through them, and found it was perfectly evident that the sea went up to the Bitter Lakes. There were strata of salt in some cases 6 feet thick. He thought they were all deeply indebted to Mr. Holland for his paper. (Cheers.)

In reply to further questions from Bishop PERRY and others,

Mr. HOLLAND said :—The primitive dwellings on the Sinaitic Peninsula were very like the beehive-houses of Scotland. There was no doubt that the Bitter Lake was connected with the sea, but the question was whether it was so at the time of the Exodus. Further down the gulf were to be found raised beaches, so that there had been an upheaval of the coast. The Pillar of Cloud and the Pillar of Fire were certainly a difficulty in regard to a division of the Israelitic host. It could be got over by supposing that the main body was guided by the pillars, while communication was kept up with the smaller bodies. A liquid exuding from the tamarisk tree was called manna ; but this could not be the manna of the Bible, because it was not white, and because there would not have been enough of it to feed the Israelites.

A MEMBER stated, that those in the neighbourhood of the Suez Canal said that since the construction of the canal the rainfall had largely increased. It was possible that when the sea extended further up the country it was much more fruitful, and tamarisk trees might have existed in much larger numbers.

Mr. HOLLAND said, that it was proved by the clay deposits to be found in some of the valleys that there was a much larger amount of vegetation in former times than there was at present.

The meeting was then adjourned.

ORDINARY MEETING, MAY 19, 1879.

H. CADMAN JONES, Esq., M.A., IN THE CHAIR.

The minutes of the last meeting were read and confirmed, and the following elections were announced :—

LIFE MEMBER :—C. A. Hingston, Esq., M.D., L.D.S., Plymouth.

MEMBERS :—T. B. Dale, Esq., J.P., Warwick ; Rev. W. Pennington, M.A., J.P., London ; Rev. C. Lacy, M.A., J.P., London.

Also the presentation of the following Works for the Library :—

“Mind and Living Particles.” By Dr. J. M. Winn. *From the same.*
 “Sketch Books of the American Church.” By the Rev. Dr. Batterson. *Ditto.*

The following paper was then read by the Author :—

THE ETHNOLOGY OF THE PACIFIC. With a Map.

By the Rev. S. J. WHITMEE, A.V.I., F.R.G.S., &c.

THREE are three classes of people inhabiting those islands of the Pacific Ocean which I include under the term Polynesia. In the western islands, from the east end of New Guinea and Australia, eastward as far as and including Fiji, we find a black, frizzly-haired people; in all the eastern islands there are large brown straight-haired people (these are found also in New Zealand); and in the western islands north of the Equator there are smaller brown straight-haired people.

These three classes of people are represented in the map by the colours blue, pink, and purple respectively.

In a paper recently read before the Anthropological Institute, I have proposed the following names for these people.

To extend to all the blacks of the western islands the name *Papuan*,* which has long been applied to the black people of New Guinea, and some other portions of the Indian Archipelago. They have already been called Papuans by some writers, but are generally known as Melanesians. I believe these people are essentially like the Papuans of the Indian Archipelago, and that one name may serve for both.

For the natives of Eastern Polynesia and New Zealand I proposed an entirely new name, because there is no good general term by which they are known. This is *Sawaiōri*.† For those living on the north-western islands I also proposed a new name, viz., *Tárapon*.‡ The adoption of these names may be objected to by some ethnologists; but as my reasons for proposing them have been given in the paper mentioned, which will shortly be published, I shall not defend them here. In the present paper I shall use these names, giving, however, the others by which the people have been hitherto known.

I. THE PAPUANS.

Melanesians, Negritos, Negrito-Polynesians, and Black Polynesians.

In colour these islanders are mostly black, or nearly so; but not of a jet black. Some are much lighter than others. It was long popularly supposed that their hair grew in small tufts. This was, however, a mistake which probably arose from the manner in which many of them are accustomed to dress it. On some islands the men collect it into small bunches, and carefully bind each bunch round with fine vegetable fibre from the roots up to within about two inches of the ends. Dr. Turner, in his "*Nineteen Years in Polynesia*," gives a good description of this process.§ He counted the number of bunches on the head of a young man, and found nearly seven hundred. He also calls attention to the strange

* "Papuah, frizzled, woolly-headed, having many natural curls"—Marsden's *Malay Dictionary*. "Papuah, frizzled; the island of New Guinea; an inhabitant of that island, being of the Negrito race."—Crawfurd's *Malay Dictionary*.

† From *Sa-moa*, *Ha-wai-i*, and *Ma-ori*, the names of three representative peoples belonging to the race.

‡ From *Tara-wa*, and *Pon-ape*, names of two representative islands in the Gilbert and Caroline groups respectively.

§ Pp. 77 and 78. Opposite to p. 76 is the figure of a Tanna man, which may be compared with the sculpture on p. 78.

resemblance existing between the hair of these people thus dressed and the conventional representation of hair in the Assyrian sculptures, with which we are all familiar. When allowed to grow naturally, the hair of the Papuans is always frizzly.

In the features of these people there is considerable difference. In a typical specimen the lips are somewhat thick, the nose is broad, often arched and high, but coarse. Their jaws project, and they may, as a rule, be said to be prognathous. They are generally small in stature; but in some islands the natives are comparatively large. Where, however, they are of large size, we almost always have other evidence of their mixture with another race. Speaking, therefore, of the typical Papuans, we may say they are small, with thin limbs, and are physically weak. In their natural condition they are a savage, bloodthirsty race: one of the most savage races of men living. They are invariably cannibals. As far as I know, we have never yet come to know any portion of the race without finding them addicted to this horrid custom. They are also always broken up into small hostile tribes, holding no intercourse with one another, except by warfare. This is one of the most constant characteristics of the race. The different languages spoken by them are very numerous, owing, no doubt, to their hostility towards one another. A missionary may learn the language of a tribe living in a particular valley, and on gaining access to a tribe in the next valley, only a few miles distant, may find himself unable to communicate with the people, owing to their language being so different from the one he has learnt. In the grammatical structure of these languages there is a considerable resemblance, as would naturally be expected; but owing to long isolation through the savage disposition and hostility of the people, the verbal differences have become very great.

Among them women hold a very low position. They are merely the slaves and tools of the men. Nearly all the hard work falls to their share, the men devoting themselves chiefly to warfare. The women work at the plantations, carry the burdens, wait on the men, and take their food from the leavings of the lords of creation. The men will think they do well if, with their arms, they protect the women from the attacks of other tribes.

You may well imagine such a people to be in every respect low in the scale of humanity. They are low socially, as we have seen. Their family life is not greatly elevated above the relationships existing among the lower animals. The relations between the sexes are of the most degraded character, with a

few redeeming qualities. Affection is no doubt manifested towards children, but even this is seen among the lower animals, and does not, of itself, indicate much tenderness of disposition.

In their mode of government might is right; and might is nearly the only thing which commands anything like respect. Intellectually too I should say the Papuans are low. As a rule they appear to lack the elaborate traditions and poems and songs found among many barbarous races. I think there are few indications among them of much power of mind. Religiously, too, they are low. They are not naturally a people possessing much religious feeling or reverence. Their religious systems, such as they have, are more of the nature of fetishes than anything else.

In arts and manufactures they are comparatively low, although there are some exceptions. Usually their houses are poor structures. On many islands the people have no boats, or their canoes are of very inferior construction. As a race they are not navigators. Their arms are, however, somewhat elaborately made, and most of them make a coarse kind of pottery. In some parts of the Solomon group the people build much better houses than those usually found among the Papuans; they also carve some of the woodwork in their houses rather elaborately, and build good sea-going boats. These things are, however, so exceptional that I am convinced they indicate contact and mixture with another race. In Fiji the people build good houses and good boats; but we know the Fijians are mixed with Sawaiori blood. I think it a justifiable inference that the Solomon islanders are also considerably mixed: and the reports of visitors to the group respecting the size, colour, and appearance of some of the people prove this inference to be correct.

Indeed throughout the whole of the Papuan region there is evidence of more or less mixture of the people with Sawaiori blood. In some islands there are pure colonies of the latter people, who keep themselves distinct from their blacker neighbours; but in many other places they have mixed with the black aboriginal population, and have considerably modified it. The map shows by pink patches and bands the positions of these colonies, and the extent of the mixture of blood as far as our present information goes.

Missionaries have ever found the Papuan race a difficult one to influence and elevate. They are lower and more savage than the Sawaiori people. There is less original capacity for the appreciation of that which is noble and good than we find among the others. There is in them less inherent religious feel-

ing, or less of what may be called the religious instinct. There has therefore been more difficulty in finding a fulcrum upon which to rest the lever by which they are to be lifted. They no doubt, like other men everywhere, possess the capacity for religious belief and worship, but it is naturally of a low order. Hence Christian missions have been more difficult, and the success achieved has been less, in proportion to the means used, than among the other people of the Pacific.

The following broad characteristics of the Papuan languages I give in substance from a paper of my own recently contributed to the Philological Society. Consonants are freely used, some of the consonantal sounds being difficult to represent by Roman characters. Many of the syllables are closed. There is no difference between the definite and the indefinite article, except, perhaps, in Fiji. Nouns are curiously divided into two classes, one of which takes a pronominal postfix, the other which never takes such a postfix. The principle of this division appears to be a near or more remote connection between the possessor and the thing possessed. Those things which are connected with a person, as the parts of his body, &c., take the pronominal postfix. A thing possessed merely for use would not take this postfix. For example, in Fijian the word *luve* means either a son or a daughter—one's child, and it takes the possessive pronoun postfixed, as *luvena*; but the word *ngone*, a child, but not necessarily one's own child, takes the possessive pronoun before it, as *nona ngone*, his child, i. e., his to look after or bring up.* Gender is only sexual. Many words are used indiscriminately, as nouns, adjectives, or verbs, without change; but sometimes a noun is indicated by its termination. In most of the languages there are no changes in nouns to form the plural, but a numeral indicates number. Case is shown by particles, which precede the nouns. Adjectives follow their substantives. Pronouns are numerous, and the personal pronoun includes four numbers—singular, dual, trinal, and general plural; also inclusive and exclusive. Almost any word may be made into a verb by using with it the verbal particles. The differences in these particles in the various languages are very great. In the verbs there are causative, intensive or frequentative, and reciprocal forms.

I have already said I believe these people belong to the same race as the Papuans of New Guinea and some other parts of the Indian Archipelago. Those who know the latter

* Hazlewood's *Fijian Grammar*, pp. 8 and 9.

people will recognize the characteristics which I have given as being almost equally applicable to both. It is for this reason I have proposed to use one name for all—the Eastern and Western Papuans, those of Polynesia and those of the Indian Archipelago.

In a lecture delivered last year at the Royal Institution Prof. Flower, F.R.S., virtually admitted that these people are alike, although he used different names for them. After speaking of those in Polynesia under the usual name Melanesians, he says :—

“People having very much the same physical characters as the Melanesians inhabit the islands of the Louisiade Archipelago, those of Torres Straits, and a very considerable part of New Guinea, and even some of the islands farther west, as Aru, Timor, Gilolo, &c. The exploration of New Guinea in an ethnological sense is only now commencing, and promises a most interesting feature. The greater part of the island is certainly inhabited by a dark-skinned race, with crisp or frizzled hair; indeed, the name by which they are frequently known, *Papuans*, is said to allude in the Malay language to the latter peculiarity. It is, however, very doubtful whether they all possess the uniform characters of the genuine Melanesian.”* The last sentence refers to a now well-known mixture of races in parts of New Guinea, which I shall have occasion again to mention.

Until recently I should have said the eminent naturalist, Mr. A. R. Wallace, controverts the opinion of the essential unity of the Papuans of Polynesia and those of the Indian Archipelago. But his article in the *Contemporary Review* for February last† shows clearly that he has changed his view on this point since he wrote his “Malay Archipelago.” In this recent article he speaks of “the Papuan or Melanesian.” And in his description of the people he speaks indiscriminately of natives of New Guinea, New Caledonia, and the New Hebrides; and he gives the area occupied by the people as one “of which New Guinea is the centre, extending westward as far as Flores, and eastward to the Fijis.”

I feel some satisfaction in noting this change in Mr. Wallace’s views, because not many years ago‡ I tried to prove he was wrong in believing that all the people of Polynesia belonged to one race, and had no relationship with the

* Royal Institution Lecture, May 31, 1878, p. 38.

† *New Guinea and its Inhabitants*. See pp. 426-428.

‡ *Contemporary Review*, Feb., 1873.

inhabitants of the Indian Archipelago, and this is, I believe, the first time he has published a different opinion.

As to the wider affinities of these Papuans with other peoples of the world, I wish to speak cautiously. But I believe they may be remotely classed (together with all the other black people of the Southern hemisphere) with the tribes of Africa. In all essential respects they appear to be remote relatives, and the differences between them may probably be accounted for by (1) long isolation; (2) dwelling under different conditions in their various localities; (3) in some cases more or less mixture with other races.

Prof. Flower thinks the resemblance between the Papuans and African Negroes "which appears to strike every one who sees them for the first time, is rather superficial, and depending much upon colour and the character of the hair."* But Mr. Wallace, in the recent article I have already mentioned, says, "it is impossible not to look upon" these "Eastern Negroes" and the Africans "as being really related to each other, and as representing an early variation, if not the primitive type of mankind, which once spread widely over all the tropical portions of the Eastern hemisphere."† In the main, I take Mr. Wallace's view.

That the Papuans were the earliest occupants of the various places where remnants of the race are now found, and that they have, in many places, been partly or wholly overrun and displaced by more recent races, I think is unquestionable.

II. THE SAWAIORI RACE.

Polynesians, Brown Polynesians, Malayo-Polynesians, and Mahoris.

These people are a large-sized race, their average height being about 5 feet 10 inches. They are well-developed in proportion to height. Their colour is a brown; lighter or darker, generally, according to the amount of their exposure to the sun; being darker on some of the atolls where the people spend much time in fishing, and among fishermen on the volcanic islands; and lighter among women, chiefs, and others less exposed than the bulk of the people. Their hair is black and straight, but wavy or with a tendency to curl in individual examples. They have very little beard. Their

* *Royal Institution Lecture*, pp. 37 and 38.

† *Contemporary Review*, Feb., 1879, p. 427.

features are generally fairly regular, eyes in colour invariably dark, and in some persons a little oblique. Jaws not projecting except in a few instances; lips of medium thickness, thicker than our own. Noses generally short, but rather wide at the bases. Their foreheads are fairly high, but rather narrow.

When young many of the Sawaiori people of both sexes may be spoken of as being fairly good-looking. The men, I should say, have more regular features than the women. The women, even if they are good-looking when they are young, soon lose their beauty. More attention was paid to personal appearance among the men than among the women; but such is not the case now.

As an uncivilized race the Sawaiori people are remarkable for their superior manners. They are a very polite people, and are far above mere savages. Indeed, there are many indications that they have descended from a state in some respects superior to that in which they were found at the time they were discovered by Europeans. The position occupied by women is one of these. Among this race generally women occupy a position hardly inferior to that of the men. Among the most polite and superior of the people women have as much influence and are treated with as much respect as among civilized races. They, in some instances, take hereditary titles and offices. It is well known to you all that a queen long reigned in Tahiti—Queen Pomare; and this is not an exceptional circumstance. Another indication of the comparative elevation of the people is the existence of rank and titles which are hereditary. Among most of these people as much is thought of rank as among ourselves. And so much deference is paid to chiefs that a different language is used in addressing them from that used to common people. Every part of a chief's body and all his belongings have different names from those appropriated to people of no rank. If a chief possess a dog the animal must be spoken of by a different name from that given to a common man's dog. The grade of rank of a person is indicated by some words addressed to him, three or four grades being recognized, and as many different terms being employed. For example, in Samoa there are four different words for to come, appropriated to four grades of people:—*sau*, for a common man; *maliu mai*, for a person of respectability; *susu mai*, for a titled chief; and *afio mai*, for a member of the royal family. When addressing a person in respectful language, the Samoans never use the first personal pronoun in the singular number, but always in the dual—the dual of dignity. This excessive politeness is sometimes somewhat

puzzling or amusing to those newly arrived in the islands, and who may not have become accustomed to it. I remember the first time I noticed it I was riding a horse, and being met by a native he asked—"Where are you two going?" a very ordinary mode of salutation to a person when on a journey. I at first thought he meant the question for me and my horse. But it was simply the dual of respect.

The way in which landed property is held and transmitted among the people also indicates something above savagery. It is not unlike the tenure of such property by the Israelites under the Mosaic laws. All the land in the islands is divided amongst families. An individual does not own it; but the members of the entire family have an equal right to its use; the patriarch or recognised head of the family, however, alone properly exercising the right to dispose of it, or to assign the use of it for a time to persons outside that family. Thus the land is handed down through successive generations under the nominal control of the recognised head of the family or clan for the time being. I use the word clan here, because the word family, in our sense of the term, does not express its full meaning among these people. A family is not the husband and wife and their children; but a whole clan, consisting of all the connections by blood and marriage. Each family or clan has a name, which is always borne by one of the oldest or most influential members, and the man who bears that name is the patriarch or head of the entire clan.

During the past few years this custom has been considerably changed in Samoa, and some of the larger families are broken into several sections—the nominal head of each section bearing the family title with a second name for the sake of distinction. In this way the binominal system is growing.

I believe these people once occupied a higher intellectual position than that they now occupy. They have most elaborate myths and songs—some poems being of considerable length, and I think superior in composition to anything the people were capable of at the time when Europeans first came into contact with them. The best of these songs and traditions are kept in Samoa in two forms—in prose and in poetry; and certain families are the recognised keepers of them. They were retained with great accuracy without being written—a father paying the greatest attention to teach them with verbal accuracy to his sons. The prose form of an important myth was not considered authoritative unless it agreed with the poetic form.

All the Sawaiori people were navigators before they were discovered by Europeans. Their boats were somewhat

elaborately made and were very large. In them they made long voyages between the different groups. They sailed at certain seasons regulated by the appearance of certain constellations, and directed their courses by the stars. There can be no doubt but that a considerable amount of intercourse was kept up between the people in some of the distant groups in this way.

I think most members of the Institute will agree with me that all these characteristics taken together indicate that these people occupied a comparatively high level; and whether I have convinced you or not, I am myself quite satisfied that at the time of their first contact with Europeans there were indications that they had previously occupied a still higher position.

Let me now give you a few more of their general characteristics. As a race they are somewhat apathetic—differing, however, in different islands according to their surrounding circumstances. They live in an enervating climate, and on most of the islands nature is very lavish of her gifts. So they lead easy lives which foster an apathetic disposition. On the more barren islands and those more distant from the equator the people have more energy of character. All the people of the race think very well of themselves, and of some, at least, I should say they are very conceited.

As a people they are religiously inclined. They were strict and superstitious in their religious observances when they were heathen. Of them generally it may also be said, they were easily influenced by Christianity. They presented a contrast in this respect to the Papuan race. They possess a good measure of natural politeness—and in this respect the common people generally are immensely superior to the peasantry in our own country. I never met with a comparatively uneducated people who possessed more good common sense, and who would generally take a more reasonable view of things than the Sawaiori people with whom I came into contact. In every respect I may say they are a rather superior people.

The following brief sketch of the most prominent characteristics of their language may suffice for this paper. The phonology is simple. With one exception all the sounds found in them may be expressed by the Roman letters with their ordinary values. This exception is a sound which we call a "break," a kind of pause in the breath, which is between an aspirate and a *k*. A *k* sound takes its place in some of the languages. In those languages in which this sound occurs we usually write it by an inverted comma, as in the name *Hawai'i*. The vowel-sounds are all simple, as in Spanish. Every syllable is open. To this there is no

exception. Some words consist entirely of vowels. Phonetic changes have taken place according to law, so that a given word in one language may have its form in any other language, if it be found in it, predicated. As a rule the accent is on the penultimate syllable; but in a few cases (chiefly when the last syllable ends in a diphthong or a long vowel, which is really a double vowel) on the ultimate. Very rarely, in some languages, the accent may be on the antepenult. There is an indefinite as well as a definite, and in some languages a plural article. Many words may be used as nouns, adjectives, verbs, or adverbs, without any changes of form. But some nouns are formed from the verb by taking a suffix, and some adjectives are formed from the noun in the same way. Gender is only sexual. There is some variety in the way of indicating number in the noun. In Samoa many nouns have special plural forms. The cases are indicated by prepositions. Proper names in the nominative case take a prefix, as *O Tahiti*, *O Samoa*, &c. Adjectives follow the substantives. The pronouns are numerous. Personal pronouns are singular, dual, and plural. The form of the plural in some languages shows that it was originally a trinal. In the verbs the distinctions of tense, mood, and voice are indicated by particles prefixed or postfixed. Number and person are generally regarded as accidents of the subject, and not of the verb. To this, however, the Samoan forms an exception; in this language many of the verbs have a special plural form. In all the languages there is a causative which is formed by a prefix to the verb. There are also intensive or frequentative, and reciprocal forms of the verbs. The intensive is usually a reduplication of the active verb; the reciprocal is usually formed by both a prefix and a postfix. Verbal directive particles are freely used, to direct towards, away from, or aside. In some languages, especially that of Samoa (I have already given examples above), many ceremonious words are used to persons of rank. Words which form part of the name of a chief are often disused during his life; and in some places they are disused after his death.

These languages are fairly copious, considering that they have been isolated and used by a people in small islands; and that until lately they have had no opportunity of gaining accretions from the outer world. Of the affinity of the people with other races, and the relationship which their languages bear to others, I will speak after describing the next people.

The Sawaiori race is, I think, very pure. In a few places it is, doubtless, a little mixed with Papuan blood; but this is only to a small extent. The people consider themselves

superior to the black race ; and while the black men will have brown wives, where the two races come into contact, whenever they can get them, I think a Sawaiori man would hardly have a Papuan wife, unless he could not get one of his own race. The Sawaioris occupy all the eastern islands in Polynesia from the Ellice group to Easter Island. There are also colonies of them found among the Papuans in the western area in the Loyalty Islands, the New Hebrides, and the Solomon group ; and we now know that many of the inhabitants of the eastern portion of New Guinea resemble the Sawaiori people of Polynesia so much that they will most likely have to be classified with them. It is, however, probable that those on New Guinea are somewhat mixed. In the map I have indicated by pink bands in the Papuan area the relative proportion of Sawaiori mixture amongst the black race.

III. THE TARAPON RACE, OR *Micronesians*.

In the western portion of Polynesia, north of the equator, there is a wide belt of low atolls or lagoon islands, usually known as Micronesia. Nearly all these atolls are peopled by a brown race of men in colour resembling the Sawaioris, but of smaller stature and less robust than they are. They have straight black hair, generally more lank than the hair of the Sawaiori people. These Tarapons, however, differ more among one another than the Sawaioris do. The natives of the Caroline Islands are, as far as I have seen them, much larger than those of the Gilbert group. They are also yellower in colour—more yellow than the Sawaioris, while the Gilbert Islanders are darker than the latter people.

I think there can be little doubt but these Tarapons are a people who are considerably mixed, and hence the differences which characterize them. In many respects they resemble the brown people of the Malay archipelago more nearly than they do the Sawaiori race. In fact, I think the bulk of the Tarapon people are the descendants of people who, in comparatively recent times, migrated from some portion of the Indian Archipelago ; and that, since they have been living in those north-western islands of Polynesia, they have become mixed with people of other races. Owing to this mixture, I always feel a difficulty in giving a general description which will apply to all the people in this region. The natives of the Carolines are, as I have already said, lighter than most of the others, and they differ in other respects, being larger than the Gilbert islanders, and less savage and warlike.

All the Tarapon people are navigators, and many of them build large boats, or proahs, not greatly unlike those found in the Indian Archipelago. Their houses are inferior to those of the Sawaioris. The arms of some are fairly well made, and in one group—the Gilbert Islands—they manufacture very elaborate armour to cover the entire body out of the fibre of the cocoa-nut husk. A corselet, which forms part of this, is a very ingenious and very good piece of workmanship, in shape not greatly unlike a piece of European mediæval armour.

Amongst them women appear to occupy a position not very different from that they hold among the Sawaioris, but somewhat lower. This difference is not in the amount of work and drudgery that they are expected to do, but rather in the social and domestic influence they exert. Religiously they are rather strict in the observance of their rites, and the shrines of their gods are very numerous. I visited some of the Gilbert Islands before any Christian influences had been brought to bear upon the natives, and in every house I saw a domestic shrine at which offerings of food, &c., were presented. In addition to these there were numerous other shrines in all parts of the islands.

Their gods were chiefly the spirits of their ancestors ; the priesthood and chieftainship were combined in the same persons ; they embalmed some of their dead, especially the bodies of beloved children ; and women often carried about the skulls of deceased children hung by a cord around the neck as a token of affection.

The traditions of the Tarapons appear to be numerous. In some respects they resemble those of the Sawaioris. These deal very largely with the origin of their islands and the people. From them we learn that part of the people came from the west, and that these were met by some from the east. Most of the descendants of those arriving from the east were, however, destroyed by the others, who were the more numerous. As far as we have materials for examination, craniometry also indicates that the natives of these islands are more mixed than either of the other Polynesian races. Professor Flower, in his Royal Institution Lecture already mentioned, expresses that opinion, thus confirming the opinion which I have formed from an examination of the physical characteristics of the people, and from their languages.

In these languages consonants are used more freely than in the Sawaiori languages. They have some consonantal sounds which are not found in the latter, such as *ch*, *dj* and *sh* which may perhaps be regarded as intermediate between the Sawaiori and Papuan, although not nearly as strong as in the latter.

Closed syllables are by no means rare. Occasionally doubled consonants are used, but there is a tendency to introduce a slight vowel sound between them. In all of these particulars there is an approximation towards the Papuan. Most words take the accent on the penult. In some languages there appears to be no true article. In the Gilbert Islands language we find the Sawaiori *te* used in place of both the definite and indefinite article. Gender is sexual only. Number in the noun is either gathered from the requirement of the sense, or is marked by pronominal words or numerals. Case is known by the position of the noun in the sentence, or by prepositions.

In the language of Ebon—one of the islands in the Marshall archipelago, nouns have the peculiarity which I mentioned as being characteristic of the Papuan languages; viz., those which indicate close relationship—as of a son to his father, or of the members of a person's body—take a pronominal postfix which gives them the appearance of inflections. I do not know of the existence of this peculiarity in any other Tarapon language; but would not make too much of negative evidence.

Many words may be indiscriminately used as nouns, adjectives, or verbs, without any change of form. In some languages the personal pronouns are singular, dual, and plural. In others there are no special dual forms, but the numeral for *two* is used to express the dual. In the Ebon language there are inclusive and exclusive forms of the personal pronouns which, as far as I have at present been able to ascertain, do not occur in the other Tarapon languages. The verbs usually have no inflections to express relations of voice, mood, tense, number or person, such distinctions being expressed by particles. In the Ebon language, however, the tenses are sometimes marked—but even in that, the simple form of the verb is frequently given. All have verbal directive particles. In Ponape—one of the Caroline Islands—many words of ceremony are used only to chiefs, exactly as they are used so largely in Samoa. The custom of tabooing words which occur in the names of chiefs is also found there.*

I come now to consider the affinities of the Tarapon people and also of the Sawaiori race with other portions of the human family.

Both peoples may, I believe, be traced to the Indian archi-

* Most of the above particulars respecting these languages, and also those respecting the Sawaiori languages, I have taken from my paper already mentioned.

pelago; but further I shall at present not attempt to trace them. They have affinities with the Malays and other brown people now living in the islands of the Archipelago. But I wish you to understand that I do not think they have sprung from the Malay race as we at present know it. Doubtless, the Sawaioris are now more nearly in the primitive condition of the ancestors of the whole family than the Malays. I believe that at an early period (not later than the commencement of the Christian era, but probably earlier) the ancestors of the Sawaioris, the Tarapons, the Malays, and also the Malagasy of Madagascar, dwelt together in the islands of the Indian Archipelago. From some cause or other—probably war—a portion of that people migrated eastward to Polynesia. Finding the islands in the west occupied by the black Papuan race, they went on until they reached some of the islands in central Polynesia—perhaps Samoa—and there they settled. From this point they have spread abroad to the distant eastern islands; some have gone north-east to the Hawai'ian Archipelago; some have gone south-west to New Zealand; and a few others, at various times, have gone westward into the Papuan area, and have either formed colonies there, or have mixed with the Papuan people and intermarried among them. Some have, also, in comparatively recent times, gone north-west and mixed with the Tarapon people who entered Polynesia much later than the Sawaioris.

These Sawaiories being isolated from contact with other people have retained their primitive manners with considerable purity, losing no doubt a good deal of what they originally possessed, owing to this isolation and to their living in small communities and on small islands. The changes which have taken place in them since their settlement have probably nearly all been losses, for want of circumstances to call for the use of some of the knowledge or habits which they possessed. There would be little or no addition to their knowledge, or change of any kind in the shape of accretions. Change would probably be entirely in the way of loss.

But, the people being naturally very conservative, the disintegrating process would go on very slowly. This is shown by the remarkable similarity existing between their customs, their knowledge, and their languages over the vast space which they occupy. Hence I consider that these Sawaiori people at the present day represent very fairly the condition of the primitive race from which they sprung at the time when they migrated from the common home.

The only time-mark which I know as giving an indication of the period of this migration, is the absence of Sanscrit elements

in their languages. I should therefore say it was in pre-Sanskrit times : that is, before that language reached and influenced the languages in the Indian Archipelago.

At a later period a second migration took place from the Archipelago, and moved westward across the Indian Ocean to Madagascar. This, we may conclude, was in post-Sanskrit times—after that language had to some extent influenced the language of the people—for there are a few Sanscrit elements in the Madagascar language.

Later still—I think considerably later—another migration took place from the Indian Archipelago and went eastward, settling on the north-west islands of Polynesia, commonly known as Micronesia. The bulk of these people probably came from the Philippines, or some other islands in the north-eastern portion of the archipelago. The few Papuan elements which now appear to be in the Tarapon people may have been in the original people before they migrated. But since they have been settled in these islands there has, I believe, been a considerable infusion of other blood among them.

Part of this has come from the Sawaiori race. The traditions of the people mention Samoa as the place whence some of their ancestors came ; and I think we have good reason for believing that there is truth in these. But I believe other blood has been infused by the arrival of Japanese and Chinese junks with their crews at the islands. We have well-authenticated examples of such junks being driven across the North Pacific ; and I think it is highly probable that some of these have reached the islands of Micronesia, and that their crews have settled among the original people. I have given some evidence on this point in a paper recently published in the *Journal of the Anthropological Institute*. I need not therefore repeat it here.

The present paper has not been written with any controversial object. It has not been prepared from a special point of view for the Victoria Institute as distinct from other scientific societies. But, from all that it contains, members of the Institute will see that no special arguments can be derived from Polynesia against the unity of the human family ; for all the three races inhabiting those islands have affinities with peoples in other parts of the world.

The CHAIRMAN.—I am sure that we all join in thanking Mr. Whitmee for his very interesting paper. It is now open for any one to offer remarks thereon.

Mr. J. ENMORE JONES.—I should like to ask a question upon a subject which has occupied my attention. On the 28th page of the paper the author deals with the religious notions of the Tarapon people, and asserts that their gods were chiefly the spirits of their ancestors. I should be glad to know what reasons they give for this belief, and if Mr. Whitmee has been able to get from the natives any information as to why their gods are regarded as the spirits of their ancestors?

Mr. WHITMEE.—When I was in the Gilbert Islands I made inquiries on this point, and I found that they spoke of some of their ancestors who had migrated from other portions of the Pacific; some of them great men in their history, and regarded by them as their gods—that is to say, they worshipped the memory of those ancestors. I have no doubt at all, from what I know of their traditions, that those persons who have been great men in their former history have become deified in this way.

Mr. JONES.—Then it is a mere matter of memory or recollection of persons on their part, in the same way that we respect the late Duke of Wellington or any other great man, but not a notion that the spirits of their ancestors are gods?

Mr. WHITMEE.—No; they believe that the spirit exists after death. This belief is universal in those islands, and it was for this reason that the women carried about with them the skulls of their dead children, and that the people buried their dead in their houses—in the family house. I asked them the reason why they did this, and they said, “We do it so that we may be together.” They believe in the continued existence of the spirit after death.

Rev. T. M. GORMAN.—I should like, if I may be permitted, to follow up the questions that have just been put to Mr. Whitmee. At the Hibbert lecture last Thursday a similar point arose. It was in reference to where the most ancient Egyptians are represented as paying these honours to the memory of their ancestors. I am speaking of the most ancient form of the religion of Egypt. Those ancient Egyptians are represented as having made offerings of various kinds—fruits and fowls, beef, wine and beer—to the memory of their ancestors, and I was exceedingly struck with the idea that the priesthood were united in the same persons, which brings us more or less to the patriarchal relationship as we find it stated in our Bible, also the embalming of their dead and the partition, mentioned in to-night's paper, between the spirit and the body. For my own part I think these things among the islanders referred to by Mr. Whitmee bear a striking resemblance to the ancient rites and ceremonials observed by the ancient Egyptians. I should also like to ask a question as to the use of the letters *l* and *r*. Has Mr. Whitmee noticed whether these letters are the same?

Mr. WHITMEE.—Yes, they are the same. The letters *l* and *r* are not distinguishable in Samoa. In the Samoan words in which the letter *l* occurs

the / sound is the common one, but it becomes r before the vowel i (or e, as we pronounce it); but these two letters are constantly interchanged throughout the languages. The Rev. Mr. Moulton, who has lived in the Tonga Islands, where he was connected with the Wesleyan missions, will be able to give you some information respecting the people of those islands. He is accompanied by a native gentleman.

Rev. J. E. MOULTON.—I did not come here with the intention of speaking; but as I have been called upon, I may offer a few words. Any person who has had personal intercourse with the race I have been amongst will acknowledge the wonderfully accurate manner in which it has been described in the paper we have heard read this evening. With very few exceptions I think I may say that what we have just heard coincides with my own experience after long personal knowledge. With regard to the division of the people made by Mr. Whitmee, I am quite certain it will ultimately be accepted on all hands. Writing on ethnology and geography at home is a very different thing from going out to the places treated of and acquiring a personal acquaintance with the people. Here we have to rely on the imperfect accounts given by the old navigators, and confirmed, I might almost say,—but, at any rate reappearing in our modern books and periodicals. I have seen very late editions of some of those books published for the guidance, or rather the misguidance, of our captains and sailors; and I have found in them the same errors which have been exploded numbers of times, and the repetition of which has in some cases led to mischievous results. Those who provide geographies without a personal acquaintance with the places and people have to depend upon those old books. I remember that two or three years ago, having to write a geographical work for a college, I was led to precisely the same division as Mr. Whitmee, having had personal experience of the races mentioned. I trust that his designation of the Sawaiori race may be accepted; it is the only name that can correctly be given to that people, who, I think, have a right to be consulted in the choice of the name by which they are to be designated. Now, I belong to Tonga; but at the same time I may say that there we cheerfully make way for our father, or mother, Samoa. I was forgetting that I was speaking in the presence of a gentleman from New Zealand, and perhaps he, as a Maori representative, will dissent from that statement; otherwise I think we shall all agree. We certainly do not think "small beer" of ourselves, and although we make way for Samoa, we are not content to be known under other names. Sawaiori we must regard as a very prominent group in Polynesia, and the term Sawaiori appropriately groups all that series of islands under one head. I have had Tongan pupils under me, and I think I may say that the people are certainly a most superior people. I remember reading in one of the books of the old navigators an account written by a captain who went out to that part of the world in very early times, and he spoke of those people as some of the finest savages in the world; and I may add that under the influence of Christianity they have not at all deteriorated. Considering their isolation and opportunities, I think they will bear comparison with any of the races of the world. Of course they have not 1800 years of

civilization behind them, but the wonderful progress they have made in civilization confirms the opinion that they are a superior race. If language is to be taken as an index, they must be acknowledged as very superior. Our modest lecturer has stated that the languages of the Sawaiori race are "fairly copious." I may add that I am collecting words for a lexicon of the Tonga language, and I believe I have already obtained 10,000. How those words can have been retained in circulation all these years without any printed book to preserve them I cannot understand. It is true that they have a number of songs in which very many ancient traditions have been embalmed; but I think you will all acknowledge with astonishment the vast number of words that have been retained—an amount that goes far beyond any comparison with the vocabulary of the agricultural labourers of this country. With regard to what has been said about their belief in the existence of the spirits of their ancestors, I fancy that the word "ancestor" is somewhat misleading. In Tonga there are many traditions of past ages. They represent Tubal Cain and Noah as spirits, and you can scarcely call them their immediate ancestors. There are, however, a few of later times. If this is the meaning attached to the word "ancestors" by Mr. Whitmee, I agree with him. They have a belief in the immortality of the soul after death, and they say that the soul keeps hovering about not very far from this world. This is their universal belief, and any idea to the contrary never entered the brain of a single Tongan.

Mr. WHITMEE.—I was speaking of the Tarapon race, and they speak of those who peopled their islands and the leaders of their expeditions as being their gods. I referred only to the leaders of these expeditions and the great men in their past history (most of them having existed at periods very remote) as those who have been deified.

Rev. J. SHARP, M.A.—Do they have images of those ancestors?

Mr. WHITMEE.—No; I saw a great many of what I considered to be their stone gods, and I wanted to know what were the ideas they associated with those stones, and I found that they regarded the places where they were simply as shrines. I said, when I saw one, "Is that a god?" and they replied "No; that is the place where the god lives"—their gods are spirits: the shrines are simply the places where the gods are supposed to dwell.

Mr. MOULTON.—Are not the images wrapped round with the native cloth?

Mr. WHITMEE.—Not in the cases I have referred to; they are in some cases.

Rev. J. FISHER, D.D.—I should say that the people referred to in this paper who are likely to interest us most are the Sawaioris and the Tarapons; still I am a good deal interested in the Papuans. On page 22 the paper remarks, in reference to these people, "Mr. Wallace says, 'it is impossible not to look upon' these 'eastern negroes' and the Africans 'as being really related to each other and as representing an early variation, if not the primitive type of mankind.'" Now, I do not very clearly understand this. I do not understand what the writer means by "primitive." If it only means an early race, I can understand it quite clearly and accept it; but if it means that that was the primitive

race, I think it is very difficult to accept the statement. I do not think the author of the paper would say that in the condition in which the Papuans are they have the ability or capacity to elaborate or construct a language consisting of verbs, adjectives, pronouns, and so on. We are told that the Sawaiori people have sunk or fallen; but we are not told that the Papuans have sunk, although the fact is that they have sunk more than the Sawaioris. Neither do I think that they represent the primitive type of mankind. On the contrary, I think the primitive type was a different stock altogether, and that as the people went off from the primitive race they degenerated, losing all connection with their ancestors. They did not lose their language, but they lost many things which they possessed at the outset. I should like to know what meaning the author of the paper attaches to the term "primitive type," and whether he supposes that the people of that "primitive type" were equal to the construction of such a language as that of which he has spoken?

Mr. WHITMEE.—I may say briefly that in the passage referred to I only quote Mr. Wallace's words; and I go on to say—"In the *main*, I take Mr. Wallace's view"; but on that point I do not take his view.

Rev. J. BULLER.—Does the author of the paper intend to indicate the extent of Christianity in New Zealand by the map which is exhibited?

Mr. WHITMEE.—I do not touch New Zealand. My map was prepared chiefly to illustrate missionary addresses. In speaking on missionary matters my subject is Polynesia, and I do not mention New Zealand, not having made that country a special study.

Rev. J. BULLER.—I am obliged to the author of the paper for that answer; but as I happen to have had a long residence in New Zealand I should like to say a word or two. The Maories of New Zealand, who are a very important branch of the Sawaiori race, do most certainly believe in the perpetual existence of their departed relatives, although they do not offer worship to them. Many of them have the art of ventriloquism, and without intending it they do, by means of that art, impose on the people generally. With respect to the intellectual capacity of the Sawaiorian race, I may say that some years ago, when I was voyaging from Sydney to Auckland with Captain Markham and other naval officers, while sitting at the saloon table one day, a question arose with respect to Tongatapu, and I heard Captain Markham say that he had been to the college under the care of my friend Mr. Moulton, and he said,—"You will hardly give me credence: I am astonished at the progress of those boys, not merely in mental arithmetic, but in the higher branches of geometry. I do not think I could have surpassed some of them myself." This, I think, is a good testimony to the quality of mind possessed by those natives for acquiring the higher branches of learning. I might, if there were time, add other cases.

Mr. MOULTON.—May I ask why Mr. Whitmee did not include New Zealand in Polynesia?

Mr. WHITMEE.—I use the term to include all the islands in the inter-tropical regions, and New Zealand being out of the tropics I did not include it. I think it would be more naturally included under Australasia.

Mr. BULLER.—New Zealand is generally considered conventionally to come within the term Australasia.

Mr. GORMAN.—May I ask, is there any likelihood of the myths and songs of the Sawaiorians being published?

Mr. WHITMEE.—I hope there is some possibility, or even probability, that some of them will be published. Some of our missionaries have given great attention to the collection of those myths, and I know that one or two of them have obtained large collections. I have recently been urging them to contribute their gleanings to the lately-established Folk Lore Society, who would be glad to have them. A book on the comparative mythology of Polynesia is one of the wants of modern times.

Mr. GORMAN.—Are there any traditions of the Flood and the Fall of Man?

Mr. WHITMEE.—Yes; numerous traditions of the Flood.

Mr. GORMAN.—And of the Fall of Man?

Mr. MOULTON.—There are traditions of the primeval innocence of man.

Mr. BULLER.—Some years ago Sir George Grey published a very large volume of poems and legendary tales, which he had received direct from the Maories. The book was published at a guinea.*

Mr. GORMAN.—Photographs might be given showing the manner in which the hair of the people is worn, and the resemblance to what is found on the Assyrian sculptures. These would be important matters in regard to the connection of these people with Egyptology. With regard to the letters *l* and *r*, this is another matter of interest. In the Egyptian these letters are interchangeable, there being one character for each. In Abyssinia some missionary writer noticed that the people do not pronounce the letter *l*, but always make it *r*.

Mr. WHITMEE.—I should doubt the value of the fact with regard to the letters *l* and *r*, because I think it a very likely thing for different races to confound these letters. It is not only in Polynesia and Egypt that the *l* and *r* are interchanged.

Mr. MOULTON.—On this point the evidence is very misleading. In Tonga the letter *l* is plain and distinct, and never approaches to *r*, and my difficulty in teaching the students the English language is in regard to the letter *r*. In New Zealand it is not settled, I believe, whether it ought to be represented by *l* or *r*.

At this point Mr. D. Finau, a native of Tonga, was called upon by Mr. Moulton to give the meeting an illustration by articulating the letter *r* in the word "rode": this he did distinctly, but subsequently failed to give the sound of the same letter in the word "drew." [He then recited a familiar passage from Holy Scripture in the native language.]

* My copy of this work is dated 1853, and was printed by Robert Stokes, Wellington, New Zealand, but does not bear a publisher's name. The *Transactions and Proceedings of the New Zealand Institute* contain several useful papers on the Maories.—S. J. W.

Mr. BULLER.—There is no sound of the letter *l* in the Maori language, but the letter *r* has a sound approaching that of *d* in some words; nor have we a sibilant in Maori. [Mr. Buller here repeated the same passage in the Maori language].

Mr. WHITMEE.—With regard to the sibilant, that only occurs in the Samoan and the Ellice Islands. Samoa is called by most of the other natives Hamoa, with or without the aspirate.

Mr. MOULTON.—We have the sibilant in Tonga.

Mr. WHITMEE.—Yes, that is a third example in which it occurs in a comparatively few words.

Mr. E. SEELEY.—I may say with reference to the missions, that it is represented that the Papuan race received Christianity more slowly than the other races, and yet that the natives of the Fiji Islands received it readily,—certainly with some delay at first, but afterwards thoroughly.

Mr. WHITMEE.—Yes, that is so; but it should always be remembered respecting the Fijians that they are not pure Papuans.

Mr. SEELEY.—With reference to the question of the extinction of these races, it is an idea held by many at the present day, that the degraded races of the world die out as they receive civilization—that they are unable to bear civilization. I do not believe this, and I should like to know whether the same process of extinction is going on among these races that has gone on among some others with whom civilization has come in contact? Is not this extinguishing process the fault of the Europeans rather than of their civilization? It is the custom now-a-days to identify people by their custom of land tenure, and the land tenure custom of these people is that of Ireland.

Mr. WHITMEE.—The introduction of Christianity is more difficult among the black than among the brown races, and this is certainly the case in the New Hebrides. In the Loyalty Islands the people have become Christians more rapidly than in others. We had a large force to go in and Christianize the people, who are somewhat mixed there. The asserted general decay of the Polynesians is an interesting question, which I should have liked to have discussed to-night; but it would have made my paper too long. Mr. Wallace, in a book which I only received last Saturday, says, that these people are dying out; but he takes no notice of the statistics which show that they are not dying out. Some years ago Professor Rolleston delivered an address to the British Association at its meeting in Bristol, and he then gave some facts which he had received from missionaries with regard to these people, showing that they were not dying out all over the Pacific. At that time he wrote to me for some further information, and I collected statistics, from which I found that while in some of the islands the people were most decidedly dying out, in other islands the previous decrease had stopped, while in some it had turned, through the influence of Christianity, to an increase. Where these races are dying out, it is owing to the fact that so-called civilized men went among them before Christianity with its beneficial influences was introduced. The white man went with his vices and strong drinks before the morality and religion of the Gospel were carried to those people, and thus the seeds of

destruction were sown in the constitutions of the natives. But since Christianity has been introduced it has improved and benefited the people. I have great hope that some of these people will be spared to occupy an important position among the nations of the world.

Mr. SHARP.—The Secretary having asked me to say a word or two, I may add one or two points touching on South India. I have been a missionary there, and know something of the languages. There are some peculiar features in those languages that resemble those we have heard of to-night. In every one of the instances given in the paper it is said that gender is sexual only. This is the case in the extreme south of India. With regard to the personal pronouns having forms that are inclusive and exclusive, that is the case in Telugu and in Tamil. The difficulty as to the letters *l* and *r* appears in the Tamil language, and the proper pronunciation of "Tamil" is "Tamir," the *r* sound at the end being very hard. In certain parts of the country, however, the people pronounce the letter some as *l* and some as *r*. With regard to the relations between *d* and *r*, in Telugu the hard *d* merges so much into *r* that in translating it into the Roman lettering it is often given as *r*. In Tamil, if they put two consonants together they slip a slight vowel sound in between. In the South Indian languages there is no article at all. (In Telugu every syllable is open.) As regards the patriarchal hold of property in India the property of a family is held, not as the property of the individual, but the elder brother (say) manages it for the rest as his co-proprietors. The point of the paper most interesting to me is the conclusion, and the cautious words of the author as to whence these people have come and their relation to South India and the islands of the Indian Archipelago. No doubt the Dravidian race have migrated to some of the islands—Sumatra and Java, for instance; but I do not know that they have got further.

[Mr. R. W. DIBDEN here referred to a recent number of the Journal of the Royal Geographical Society, and gave some extracts bearing upon the question as to whether cannibalism existed in New Guinea.]

Professor GRIFFITHS.—I have been called upon to say a few words; but I am a mere recluse and must trust to those gentlemen who have seen the various parts of the world for my facts, and do the best I can to generalize. There have been many facts brought before us to-night, and it will be my business to think over them and make the best I can of them. I am deeply obliged to the author of the paper, whom I have heard often, and I was much interested in some of his remarks that have tended to confirm antecedent statements, my admiration being deepened by the caution with which he has put forward his facts. He has given them, not only as a philosopher, but as a conscientious Christian, anxious not to overstep, but to bring out the truth.

The CHAIRMAN.—I should like to ask Mr. Whitmee whether he can tell us about the class to which these languages belong? Can he tell us whether the languages of this Archipelago have belonged to a class of which the Sanscrit is an instance—whether they are Aryan languages, or whether anything is known generally, as to the source from whence they come?

Mr. WHITMORE.—I have not ventured to carry my studies much into the languages of Asia and Europe, so as to trace the connection. I have been studying the Polynesian languages, and I have been urged to carry on my studies into some of those that are better known to scholars, but I have always said, I think if I use my special knowledge in the elucidation of the languages which have engaged my attention and bring them before the scholars of Europe they will be able to show the connection. I should be inclined to classify these languages, as far as I can see, with the Dravidian languages of southern India. With regard to cannibalism and the remarks that have been made as to New Guinea, it is necessary that we should be told the exact point of observation in New Guinea, as the people are so mixed there, that a remark made about one point may not be applicable to another. We need more information with regard to the people of New Guinea before we can generalize to any great extent. As to cannibalism, I know that there are cannibals in New Guinea at the present time and also in the islands round about; but there are people in New Guinea who are not cannibals. There is no doubt that the remarks made on this point are correct so far as they go.

A MEMBER.—Was there any knowledge of a Supreme Spirit before Christianity was introduced?

Mr. WHITMORE.—There was one great god, Tangaloālangi, who was worshipped all over Polynesia, and I have often thought that the traditions that exist with regard to this god may be some remnant of former knowledge which was much greater than what they now have. The name of the god I have spoken of means “Tangaloa, who dwells in the Heavens.”

Mr. GORMAN.—The statement made in the Hibbert Lecture is strikingly illustrated by what is stated in this paper. The Egyptians addressed themselves to the spirits of their ancestors, and finished off by saying that they were faithful to the great god.

Mr. MOULTON.—The god just mentioned is called “the carpenter,” or “the maker,” or “framer.” He has two brothers, and a sister is also mentioned who was remarkable for her beauty. These things seem to point to the family of Tubal Cain; but of course this is only a matter of individual opinion. “Maui” was undoubtedly Noah; and it is strange that one of the sons of Maui is marked out as having been of exceptional badness, and his deeds are notorious. In the evenings spent by the young chiefs they generally talk about the exploits of this wild son of Maui. With regard to the dying out of the people, I must join issue with the author of the paper. When Europeans first went to these islands, they had not sufficient knowledge of the language to enable them to judge accurately of the facts. It did seem, at first sight, from the traditions, that the island of Tonga had been more populous. As I got a knowledge of the language, I had grave doubts about the extent of the population, and I was soon convinced that the evidence pointed to the fact that the island had not been much more populous than it is at present. A great number of reasons might be given to show that it was never more populous than now; but figures are the best arguments. It is difficult to get a reliable census. A missionary took the census of a considerable portion of the group

at an interval of twenty years, and the increase, although in a place where the mortality had for a time been considerably above the average, had been at the rate of 25 per cent. for the twenty years, or, speaking roughly, 1 per cent. per annum. As soon as these islands have had Europeans upon them, they have had to stand the in-rush of our diseases, and they had also our vices brought amongst them. Just before I went to Tonga, whooping-cough visited it and swept away a very great number of the population. Two years afterwards it visited it again, and again carried off a great number. Now the disease is acclimatized, and the people take very little notice of it, although here and there a weakly child or an old person will be carried off by it. Influenza is another complaint that carried off a great number of persons—about 500 in three months—on that small island; now it is every year less virulent, and the mortality from it is not exceptional. There was a similar state of things in Samoa.

Mr. WHITMEE.—Mr. Moulton has given us the state of things in Tonga. In the book of Mr. Wallace to which I have referred we have the latest information, and he tells us that the people of Tonga are dying out; and with regard to Samoa, he says the people are at present estimated at between 30,000 and 60,000. A few years ago I published in the columns of *Nature* the latest census of the Samoan islands, and it was there stated at 34,000 and a few hundreds, but Mr. Wallace, in the present month, gives it at between 30,000 and 60,000. The fact is, that the estimates of former times were much too high, and on this point Mr. Moulton has evidently misunderstood the view I hold. I believe, as fully as he does, that no dependence whatever can be placed on these estimates. The decrease in the population of Polynesia generally is not as great as is usually supposed; but those who have arrived at preconceived opinions on these matters stick to them, and will not accept the facts we offer.

The meeting was then adjourned.

ANNUAL GENERAL MEETING,
 HELD AT THE HOUSE OF THE SOCIETY OF ARTS,
 MONDAY, JUNE 16TH, 1879.

The HONORARY SECRETARY, Capt. F. PETRIE, read the following report :—

*THIRTEENTH ANNUAL REPORT of the Council of
 the VICTORIA INSTITUTE, OR PHILOSOPHICAL SOCIETY OF
 GREAT BRITAIN (7, Adelphi Terrace, London, W.C.).*

Progress of the Institute.

1. IN presenting the THIRTEENTH ANNUAL REPORT, the Council desires to congratulate the Members on the position maintained by the Institute, in spite of those adverse influences which have affected nearly every interest and society; this is due, partly to the steady support of its Members,* and partly to the organization of the plan approved at the last Annual Meeting for extending the Institute's work in the United Kingdom, America, and the Colonies. (The success that has already attended the initiatory efforts in this direction and the correspondence received have proved the importance of the object sought, which can now be carried out if the Society continues to be maintained in a thorough state of efficiency and its strength augmented by increased exertions on the part of individual members).

One part of this plan was to secure the greater usefulness of the *Journal of Transactions* to country and foreign Members, and to afford them facilities for expressing their opinions upon the papers brought before the Institute prior to their appearance in the Journal. The arrangements made work well, and

* Those withdrawing have, as a rule, continued to give an indirect support.

in the *Journal of Transactions* for the present year many instances will be found of country and foreign Members having taken an active part in the proceedings, not only by giving several papers, but by contributing to the discussions in a far greater degree than usual. The value of the Journal has been thereby enhanced to all, who find much valuable matter in it, in addition to that which has come before those actually present at the meetings.

The public appreciation of the above plan is evidenced by the fact that during last year—a most trying one, in which but fourteen Town Members were added to the Society—fifty-seven Country, and thirty Foreign and Colonial Members were elected.

2. It has been felt that in no way can an appearance of antagonism between Science and Revelation be more effectually prevented in future, than by specially training men as accurate observers of scientific facts. A private member has already taken a step to give practical effect to this idea in one of our Universities, thus promoting the special objects of the Institute. The importance of this subject has not escaped the Council's attention, and it will be more fully attended to when the strength of the Institute may be sufficient.

3. The following is the new list of the Vice-Presidents and Council:—

President.—The Right Hon. the EARL OF SHAFTEBURY, K.G.

Vice-Presidents.

The Right Hon. the EARL OF HARROWBY, K.G.

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Hon. Tr.—W. N. WEST, Esq.

Hon. Sec. and Editor.—Capt. F. W. H. PETRIE, F.R.S.L., &c.

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<i>A. MCARTHUE, Esq., M.P.</i>	Rev. G. W. WELDON, M.A., M.B.
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<i>ALFRED V. NEWTON, Esq.</i>	J. BATEMAN, Esq., F.R.S., F.L.S.
<i>WILLIAM VANNER, Esq., F.R.M.S.</i>	The Master of the Charterhouse.
<i>S. D. WADDY, Esq., Q.C., M.P.</i>	D. HOWARD, Esq., F.C.S.
<i>A. J. WOODHOUSE, Esq., M.R.I., F.R.M.S.</i>	Professor H. A. NICHOLSON, M.D., F.R.S.E.
<i>Rev. Principal RIGG, D.D., Pres. W. Conf.</i>	F. B. HAWKINS, Esq., M.D., F.R.S.
<i>Rev. Prebendary C. A. ROW, M.A.</i>	
<i>J. A. FEASER, Esq., M.D., I.G.H.</i>	

4. The steady increase of the Library continues, and several new works of reference have been added.

5. The Council regrets to announce the decease of the following valued supporters of the Institute :—

Rev. Sir T. E. W. Blomefield, Bart., M.A. (Foundation Member); C. Brooke, Esq., M.A., F.R.S. (Vice-President and Life Member), whose name will ever be associated in the Annals of the Institute as that of one of its early and most active Vice-Presidents, whose many literary and high scientific attainments contributed greatly to the value of the Institute's work; Rev. C. Bigsby (Assoc.); the Rev. Preb. W. T. Bullock, M.A. (Life Assoc.); W. R. Cooper, Esq. (Hon. Local Sec.); R. S. Falconer (Life Member); the Ven. Archdeacon J. Garbett, M.A. (Associate); Professor C. Hodge, D.D., LL.D. (Member); Rev. W. D. Jones (Associate); J. Knight, Esq. (Member); Rev. Canon C. Lane, M.A. (Associate); A. H. C. Macafee, Esq. (Member); R. Mullings, Esq. (Member); Rev. E. W. Pears, M.A. (Foundation Member); Rev. J. P. Menge, M.A. (Associate); J. Penn, Esq., F.R.S. (Member); E. Wynne Roberts, Esq. (Associate); Rev. J. Saul, D.D., LL.D. (Associate); Rev. H. T. Simpson, M.A. (Associate); Rev. Craufurd Tait, M.A. (Associate); Rev. Canon T. Woodroffe, M.A. (Member); Mrs. Arthur (Associate).

6. The following is a statement of the changes which have occurred during the past twelve months :—

	Life		Annual	
	Members.	Associates.	Members.	Associates.
Numbers on 20th May, 1878	36	21	321	339
Deduct deaths	2	1	8	10
	—	—	—	—
	34	20	313	329
Withdrawn			12	18
			—	—
			301	311
Changes			-3	3
			—	—
			298	314
Joined between May 20th, 1878, and June 12th, 1879	4	2	22	50
	—	—	—	—
	38	22	320	364
	60		684	
Total	744			

Hon. Foreign Correspondents and Local Secretaries, 37.

Finance.

7. THE EARLY PAYMENT OF THE 1878 SUBSCRIPTIONS CONTRIBUTED GREATLY TOWARDS THE SUCCESS OF THE YEAR'S WORK; the Treasurer's Balance Sheet for the year ending 31st

December, 1878, audited as usual by two specially qualified unofficial members, shows a balance in hand of £17. 7s. 4d. The amount now invested in the New Three per Cent. Annuities is £854. 17s. 10d.

8. The arrears of subscription are now as follows :—

	1872.	1874.	1875.	1876.	1877.	1878.
Members	1	2	1	9	2	11
Associates.....	0	0	2	2	11	17
	—	—	—	—	—	—
	1	2	3	11	13	28

Meetings.

- MONDAY, December 2, 1878.—“On Science and Man.” By Professor NOAH PORTER (President of Yale University, United States).
- MONDAY, January 6, 1879.—“The Lapse of Time since the Glacial Epoch determined by the Date of the Polished Stone Age.” By J. C. SOUTHALL, Esq. (United States).
- MONDAY, January 20.—“Final Cause; a Critique of the failure of Paley and the fallacy of Hume.” By J. P. THOMPSON, D.D., LL.D. (*Berlin*).
- MONDAY, February 3.—“The Torquay Caves and their Teachings.” By J. E. HOWARD, Esq., F.R.S.
- MONDAY, February 17.—“The Topography of the Sinaitic Peninsula.” By the Rev. F. W. HOLLAND, M.A. (Secretary, Palestine Exploration Fund).
- MONDAY, March 3.—“On the Evidence already obtained as to the Antiquity of Man.” By Professor T. McK. HUGHES, F.R.S. (Woodwardian Professor of Geology at Cambridge University).
- MONDAY, March 17.—A Lecture (Geological Ages and the Mosaic Cosmogony). Rev. A. STEWART, M.D., LL.D. (Intermediate).
- MONDAY, April 7.—“Does the Contemporaneity of Man with the Extinct Mammalia, as shown by recent Cavern Exploration, prove the Antiquity of Man?” By T. K. CALLARD, Esq., F.G.S., &c.
- MONDAY, April 21.—“The System of Zoroaster considered in connection with Archaic Monotheism.” By R. BROWN, Esq., F.S.A.
- MONDAY, May 5.—Lecture by Professor LEE, D.D. (Glasgow University).
- MONDAY, May 19.—“The Ethnology of the Pacific.” By the Rev. S. J. WHITMEE, F.L.S.
- MONDAY, June 16.—The Annual Address by Dr. RADCLIFFE, Vice-President.

9. The meetings during this session have been numerously attended, and the improvements in the Lecture Room have, it is hoped, added to the general comfort.

Publications.

10. The Twelfth Volume of the *Journal of Transactions* has been issued.

11. LECTURES.—In many places, at home and abroad, the papers in the Journal continue to be used, both by Members and Non-members, as the basis of lectures; and several letters have been received commanding them as being just what were needed. One most active and popular lecturing Member

writes : "Without them I should be unable to give my lectures ;" another says, "Had it not been for the publications of the Institute I should never have read a paper on such a subject." (In this case the audience, a metropolitan one, among whom were 300 clergymen, requested the publication of the lecture.) The works of Reference in the Library are also utilized by Members giving lectures; and every effort is made with a view of rendering the Organization of the Institute as useful as possible.

12. The *People's Edition* is much used by lecturers, and its popularity is very encouraging. The *Special Fund* has to a considerable extent enabled the Society to carry out the second proposal in the last Report, in corresponding in regard to the Society's work with leading men in the United States, and in every British possession throughout the world.* It has also enabled them to reply to the communications from the Australian colonies pressing the great necessity for a brief effective examination of Matthew Arnold's last work, which was being extensively circulated in those colonies. The valued paper entitled "Matthew Arnold and Modern Culture," (vol. xii., p. 269)—so arranged as to supply this want and bring the Society's objects before its readers—was sent to almost every minister and several of the laity throughout the whole of the Australian colonies and New Zealand. A similar request from India, in reference to Strauss' Philosophy was met by the People's Edition of the careful paper entitled "On the Principles of Modern Pantheistic and Atheistic Philosophy as expressed in the last work of Strauss, Mill, &c.," (vol. viii., p. 266), in which the Philosophy in question is carefully analyzed. This paper has been extensively circulated throughout the three Presidencies.

13. The republication in America of some of the Institute's Papers continues, and cannot be without a good effect.

14. The Bookseller Agents continue to sell the People's Editions of the eight papers so published.

15. The entire Newspaper Press of the United Kingdom has been communicated with, and to some extent the Foreign Press also. The Institute and its objects are indebted to the Press, in England, in many of the Colonies, and in the United States.

* Bishop Cotterill's paper (vol. xii., p. 312), which has attracted much attention at home, was used in doing this (having been specially arranged so as to bring the Institute's objects before its readers). The author has since stated that his correspondence in regard to this paper, "shows that it has reached readers in every part of the world."

16. The increasing favour with which the Institute is regarded is highly satisfactory, and it continues to maintain friendly relations with Scientific Men and the leading Scientific Societies.

Conclusion.

It will thus be seen that the Institute must no longer be considered as a London Society, supported only by persons resident in the Metropolis; as recent experience amply proves that its organization can be made useful to Members living even far beyond the limits of the United Kingdom, and that in not a few instances such Members, by contributing to the Journal, and by making the Institute known, &c., greatly enhance the value of its proceedings.

The Council cannot but express its thankfulness for the success which has hitherto attended the Society's exertions.

Signed on behalf of the Council,

SHAFTESBURY.

DONATIONS IN 1878.

		£. s. d.
LIBRARY FUND.....	Admiral Nolloth, C.B.....	10 0 0
		<hr/>
		10 0 0
PEOPLES EDITION FUND.	G. Harris, Esq.....	10 0 0
	J. E. Howard, Esq., F.R.S.	10 0 0
	Messrs. Wyman	5 0 0
	F. B. Hawkins, Esq., M.D., F.R.S.	5 0 0
	Rev. J. Rate, M.A.	2 2 0
	Rev. C. L. Engström, M.A.	0 5 0
		<hr/>
		£32 7 0

The following Balance-sheet was then read:—

THIRTEENTH ANNUAL BALANCE-SHEET, from 1st January to 31st December, 1878.

	RECEIPTS.	£.	s.	d.	£.	s.	d.	£.	s.	d.
Balance in hand . . .	...	...	...	...	126	0	0	Printing	...	...
Subscriptions :—					Binding	...	...	Binding	...	...
6 Life Members	...	...	...	...	Reporting	...	...	Reporting	...	...
3 Members 1876	...	...	...	...	Stationery	...	...	Stationery	...	...
18 "	1877	...	...	...	Postage	...	...	Postage	...	...
282 "	1878	...	...	...	Advertising	...	...	Advertising	...	...
5 "	1879	...	...	...	Expenses of Meetings	...	...	Expenses of Meetings	...	...
24 Entrance-fees	...	...	...	...	Rent to Christmas, 1877	...	...	Rent to Christmas, 1877	...	...
2 Life Associates	...	...	...	...	Salaries for Year, Clerk	...	...	Salaries for Year, Clerk	...	...
1 Associate, arrears	...	...	...	...	Extra Clerks	...	...	Extra Clerks	...	...
1 Associate 1875	...	...	...	...	Housekeeper	...	...	Housekeeper	...	...
2 "	1876	...	...	...	Travelling Expenses	...	...	Travelling Expenses	...	...
18 "	1877	...	...	...	Coals	...	...	Coals	...	...
307 "	1878	...	...	...	Gas and Oil	...	...	Gas and Oil	...	...
15 "	1879	...	...	...	Water Rate	...	...	Water Rate	...	...
1 in advance	...	...	...	...	Insurance	...	...	Insurance	...	...
					Sundry Office Expenses	...	...	Sundry Office Expenses	...	...
					Hon. Secretary's Expenses	...	...	Hon. Secretary's Expenses	...	...
					Bankers' Charges	...	...	Bankers' Charges	...	...
One Year's Dividend on £787. 8s. 1d.					* Investments £67. 9s. 9d. New 3 per Cent. Annuities	...	...	* Investments £67. 9s. 9d. New 3 per Cent. Annuities	...	...
New 3 per Cent. Annuities	...	...	...	...	Library Books, Repairs, and Removing	...	...	Library Books, Repairs, and Removing	...	...
Donations to Library Fund	...	...	...	...	Balance in hand at Bank	...	...	Balance in hand at Bank	...	...
" - People's Edition Fund	...	...	...	...		
Sale of Journals, &c. . .	...	...	...	...		
					£1,377 18 11			£1,377 18 11		

We have examined the Balance-Sheet with the Books and Vouchers, and find a Balance in hand of £17. 7s. 4d.

G. CRAWFORD HARRISON, Auditors.
JOHN ALLEN,

W. N. WEST, Hon. Treas.

* Invested in November, 1878, making now £854. 17s. 10d. (see Report, § 7.)

The Right Hon. and Rev. the Lord O'NEILL, in moving the first resolution,—“That the Report of the Council now read be received and adopted, and circulated amongst the Members and Associates,” said,—My Lord President, Ladies and Gentlemen. Although I have not been in very frequent attendance at the meetings of this Institute, I have watched with some interest its published proceedings, and especially those which touch upon the relation between physical science and religion. The publications which from time to time are put out by the Society appear to me to be most valuable, indeed, I think their value cannot be overrated. The Report, at least in a note, alludes particularly to a paper which was read some time ago by Bishop Cotterill, which went to the root of the relations between “Scientific thought and Religious belief.” The Bishop supports two main propositions in his paper. The first is, that the conclusions of physical science do not possess that mathematical certainty which is sometimes attributed to them, and which is supposed to entitle them to raise their voice against religion. The second is, that there is no truth in the assertion, which is often so confidently made, that the regular sequence of physical phenomena excludes the possibility of spontaneity or will being exercised. With regard to the first of these it is to be observed that physical conclusions, even when arrived at by mathematical calculation, do not possess mathematical certainty, because they must be proved from hypotheses which lie beyond the region of mathematics. To take a simple example, trigonometry enables us to say with great certainty that if a tower standing at a certain distance subtends a certain angle at the eye, its height will be so many feet ; but the data on which this calculation is founded, viz., the distance of the tower and the magnitude of the subtended angle, are ascertained, not by mathematical calculation, but by a different process, measurement. In a similar manner all the conclusions of physical science are dependent, when derived by mathematical calculation, upon hypotheses which are not themselves in the region of mathematics, and therefore cannot be said to possess mathematical certainty. Again, when the conclusion derived from a given hypothesis is found to be in accordance with experience we cannot pronounce it to be certain, because, unless we can not only reason down from the hypothesis to the conclusion, but up from the conclusion to the hypothesis and show that no other hypothesis will account for it, we have no right to presume upon its certainty. In the second position of Bishop Cotterill he combats the assertion that there is no room for spontaneity or will in the sequence of nature's phenomena. The Bishop observes that both science and religion—including under the term “science” the theory of evolution—point to a time when the world was without form, on which, taking Mr. Herbert Spenser's view that the universe was at one time homogeneous, he reasons in the following manner. He says the universe was at this time either infinite or finite ; if it was infinite, all the particles of which it is composed being endowed with similar powers must be acted upon by equal and opposite forces ; equilibrium would by that means be maintained, and it is impossible that any change could occur. If, on the other hand, it was finite, the

effect would be that the whole mass would be concentrated, and no differentiation could take place, because that which is homogeneous cannot become heterogeneous by the action of mere law. The fact, therefore, that the parts are differentiated one from the other is a proof that some other element has been introduced besides the action of law. To use the Bishop's own words, if the regularity of nature points to law, the irregularity of nature and its infinite variety point equally to the action of will—will, not superseding law, but acting in accordance with law; and we may surely say, that if by the exertion of our own will we can put our hands in motion, and through them move bodies which are external to ourselves, and so direct and modify the forces of nature—if we can by turning a mirror in our hands throw light in whatever direction we please—if by a certain suitable arrangement of a conducting wire we can send an electric current to whatever part of the opposite hemisphere of the earth we may find most suited to our convenience, and this without violation of the laws of nature, surely it is unreasonable to deny to a higher will than ours a power to a much greater extent over matter. Nor can any reason be shown why we should not even go further, and attribute to that higher will the power of altering the forces of nature themselves, and the laws by which they are governed, if occasion should arise for such an interference. I am unwilling to trespass further on the time of the Meeting, but there is one observation which I feel tempted to make on the subject of the bearing of the doctrine of evolution upon a belief in Scripture. I cannot but feel how presumptuous it is in one who is so little known to the members of this Society, and who follows at so humble a distance in the path of science, to speak upon such a subject before such an assembly, but the indulgence hitherto accorded to me encourages me to trespass a few moments more upon your time. I am no advocate for the doctrine of evolution; on the contrary, I cannot see that it is founded upon any solid ground, and I do not expect that it will ever become an established doctrine of science; but, at the same time, the more I consider the matter the less can I share in the dread which is sometimes entertained of it as being antagonistic to Christian faith. If we believe that the world was created by external agency—and I think all will acknowledge there is nothing in the doctrine of evolution antagonistic to this belief—and, if I do not mistake, even Mr. Darwin would acknowledge this—we may surely believe that the Creator endowed matter with all the powers which it possesses, including, according to the theory of evolution, what may be described in words now well known "as the promise and potency of all terrestrial life." And if we believe that the Creator has done this, the question appears to me to be reduced simply to one of time, viz., the question whether all was done at once, or whether it was done by creative acts put forth from time to time. And the question of time seems to me to be of but little consequence when we are speaking of Him in whose sight a thousand years are but as yesterday. It is true that there are some passages in the Book of Genesis which appear, on a *prima facie* view of them, to be at variance with the doctrine of evolution; but at the same

time, I think we need not despair, supposing that doctrine to be ever established, which I do not believe it will, of reconciling even these with it. There is, for example, the passage stating that "The Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul." If we believe that the dust of the ground consisted of particles on which the Creator had conferred the power of developing first into vegetable and animal life, and afterwards into human life, I do not see that there need be any difficulty in reconciling this passage with the doctrine of evolution. It would seem to me that it might be done with quite as little, or even less violence to the words of Moses, than is involved in the interpretation adopted by certain geologists who explain the six days as being six lengthened periods of years. I thank the Meeting for the kindness with which they have heard me, and I beg to move the resolution which has been placed in my hands.

Sir JOSEPH FAYRER, K.C.S.I., F.R.S.—My Lord, Ladies, and Gentlemen, I have much pleasure in seconding the resolution that has just been put. It is very gratifying to know that the Victoria Institute is progressing so satisfactorily, that it has increased its members so materially during the past few years by the addition of names of persons of education, of culture, and of influence; and that it continues to diffuse its beneficial influence so widely, not only at home but in foreign countries. I feel, my Lord, that I have very little right to speak here, nor should I have dreamt of doing so if I had not been invited. I am quite a recent associate of this Society; I have therefore had very little opportunity of making myself acquainted with its work, or of becoming familiar with its proceedings. Still, I am not altogether ignorant. I have read the *Journal*, I have heard several of the papers, I have listened with much attention and interest, and I hope profit, to the discussions that have followed those papers, and I have become convinced thereby that, conducted upon principles of philosophic and sound scientific inquiry, the Institute deserves the support that it receives, and that it is well calculated to produce great benefit. I observe in the Report one paragraph which refers to antagonism between science and revelation. I trust where such an antagonism *does* exist that the influence of this Society will make itself felt. For my own part I believe that there can be no antagonism betwixt religion and science (hear, hear)—between true science and real religion. Men may misapprehend, they may misinterpret one, or they may be totally ignorant of the other; they may give rise to discussions that may be characterised by acrimony, by harsh terms, by offensive epithets; that is the antagonism between individuals, it is not the antagonism between religion and science. My conviction is that the more science is known and studied, the more it is developed, the less appearance of antagonism there will be between it and religion. I think I may venture to say it with all deference, that there is far too great a tendency in the present day to decry men of science, to use harsh terms of them, to call them infidels, and by many other opprobrious terms. Now I really believe that for the most part they deserve no such epithets. Their object, I believe, is as honestly

to investigate and to find out the truth, as it may be that of any member of this or any other society; and surely if they teach *the truth* they cannot be teaching that which is antagonistic to true religion. I observe that it is an object of this Society to investigate fully and impartially the most important questions of philosophy and science, with the view of reconciling any apparent discrepancies between Christianity and science. I trust most sincerely that it will continue in the same spirit in which I believe it has hitherto been conducted, to follow out that aim, and if it does it will surely win for itself the suffrages, not only of literary men, but also of men of science; and I am equally sure that the more you can associate all these upon the lists of your Society, the better will be its results, and the more satisfactory its proceedings. I will not trespass any longer upon your time, but will simply second the resolution.

The resolution was then put, and carried.

Mr. W. FORSYTH, Q.C., M.P.—My Lord, Ladies, and Gentlemen, I shall occupy your time but a very few moments, for I am at present far from well; but I have been asked to move a resolution, which I am sure will receive your cordial welcome, and that is—

“That the thanks of the Members and Associates be presented to the Council, Honorary Officers, and Auditors for their efficient conduct of the business of the Victoria Institute during the year.”

Now, we all know that the success of every institution and society, whether secular or religious, depends very much upon the zeal, activity, and skill of the officers who conduct its affairs, whether they be committee, council, or board; and tried by this test I think you will see that the council and officers of this Society deserve our warmest acknowledgments. Its position and prospects are now most satisfactory; it has struck its roots deep, and I think in a large degree it possesses the confidence of the public. It has had to go through trying times. It was established, I think, in the year 1865, and the first year it had only 179 members. It now numbers more than 800. It has extended its operations throughout the United Kingdom, to America, and the Colonies, and is in a most flourishing condition. It was at one time in debt but that has been entirely paid off, and I think the Institute has the prospect of a bright and flourishing future.* Now for all this we are indebted, I think, very much to the council and the officers of the Society (applause). But

* Founded in 1865, the Institute met with varied success in its earlier years, and 1871 was commenced with 202 Members and Associates on the books, and the liabilities (about £1,000) alluded to. At this time alterations in the conduct of its business were made which have worked favourably. With economy (the total amount of the salaries for five years, 1871 to 1875, was only £188. 6s. 8d.—a yearly average of under £38,—during these years the numbers rose to 647), all debts have been paid off, and life subscriptions are regularly invested, some which had been spent in earlier years have been also refunded. Since 1871 the Institute has maintained a steady advance. Its present financial position is represented in the annexed balance-sheet.—ED.

more particularly do I congratulate this Society on the success it has had in realizing the object for which it was founded; that was, as you all know, to reconcile apparent discrepancies between science and revelation, and to explain away difficulties which had then perplexed, and now still perplex to a great degree, the mind of the honest inquirer after truth. We live in an intellectual age; there never was a time, perhaps, when the human mind pried more into the secrets of nature than it has done in the last fifty years. The progress of science has been remarkable; its triumphs have been brilliant; and in no period of the world's history have the advances made by science been more remarkable than those of the last fifty or eighty years. Well, no doubt, this has been a great gain to humanity; the human intellect has been extended, the mental horizon has been enlarged, and there has been a great addition to the comforts and conveniences of material life; but, unfortunately, accompanied with all this, there has been a tone adopted on the part of some—happily only some—men of science, I will not say only unfavourable, but positively hostile to religion. And by religion I mean not only revealed religion, namely Christianity, but the great truths of Natural Religion itself; many of the doctrines tending to rank materialism, to the denial of a personal Creator, and the extinction of all our hopes of a happy immortality hereafter. Well, no doubt there were great perplexity and confusion felt in the minds of many, because they thought that as science must be true, and science and religion seemed to be opposed, religion must be false. It was a happy thought, therefore, I think, on the part of the founders of this Institute, to endeavour to array on the side of religion men who should not merely be religious men, deeply convinced of the truths of religion, but men perfectly competent to grapple with science on its own ground, to fight the enemies of the faith with their own weapons, and engage in controversy with them upon equal terms. Now, it seems to me that two great causes of the difficulties which weighed upon men's minds were these: —the one was that they were unable to distinguish between the real discoveries of science on admittedly-proved facts, and the theories and conjectures of science which were dogmatically put forward by men of science as if they had been really proved; and secondly, I think, men were apt to take too narrow a view of revelation itself, and to expect to find in it what revelation does not contain. I think the more rational view to take of it is that we should not expect to find in revelation enunciations and explanations of physical phenomena, or that the progress of the human mind should be anticipated, and scientific facts revealed to men which had nothing whatever to do with the spiritual nature or the moral government of the Great Ruler of the universe. With respect to the object of the founders of this Society, I must say that they have carried it out with wonderful efficiency and success. It is impossible to look at the papers that have been selected for the purpose of discussion in the Victoria Institute, and not see that they are the productions of men of enlarged intellect, of singular powers of scientific observation, and who are as perfectly competent to deal with scientific subjects as

any of those men whose opinions on religious subjects differ so widely from their own. And although I confess some of the papers have been too deep for me entirely to comprehend, and although I may take different views from the authors of those papers, I think the result has been that the public now see that there need be no real opposition between science and religion, because they find men who are deeply imbued with scientific knowledge, who are conversant with all the data on which it is necessary to build up the fabric of scientific truth, avowing themselves at the same time firm believers in the doctrines of religion—in short, that men can be, as is shown by those who have read and discussed the papers in the Victoria Institute—not only profound philosophers, but devout and sincere Christians. Now, I think that that has been very mainly due to the care which has been taken by those who have the government of this Society in the selection of the subjects and the choice of the men to handle these subjects, because there is little doubt that from the difficulty and delicacy of many of the topics, if they had been put into the hands of incompetent men the result would have been disastrous, instead of beneficial. I believe the result has been beneficial, and that much good has been done to the cause of religious truth by the discussions that have taken place in this Society; and for those results I believe you are mainly indebted to the superintending care of the officers of this Society, and I have therefore great pleasure in moving this resolution of thanks to them.

Rev. R. THORNTON, D.D.—My Lord, Ladies, and Gentlemen; the mover of this resolution has very fairly argued from results. This is an age in which we are told we must always be paid according to the results; I therefore think it just, that, seeing the result of the labours of the Council, we should pay to them the reward which they so well deserve; and I accordingly, with great pleasure, second the vote of thanks. I notice that in trials in Courts of Justice, it sometimes happens that there is no doubt about the phenomenon; as, for instance, from the appearance of a black eye it is clear that an assault has been committed, and there is a very considerable probability that the prisoner at the bar has had something to do with the production of the phenomenon; at the same time it is not so clearly shown by the evidence by what hand it was done so as to bring it home to him. I am very happy to stand before you and say that we are able to bring home to the Council the charge that is made in our resolution. I am one of the Vice-Presidents, and have the honour of presiding very frequently at the deliberations of the Council, and I assure you that it is a great gratification to me to do so, because I find an amount of intelligence, ability, and business knowledge brought to bear on the affairs of the Institute which is a very great credit to the Council, and advantage to the Institute. Therefore, in the capacity of evidence for the prosecution, I beg you to find the Council guilty of thorough capacity and careful attention to business; and I ask you to condemn them to accept your warmest and most cordial thanks for the labours which they have so efficiently performed. (Cheers and laughter.)

The resolution was carried unanimously.

Mr. A. MACARTHUR, M.P., in returning thanks, said : My Lord, Ladies, and Gentlemen, in answering to this vote I may say that this is the first intimation I had that I was expected to say a word on this occasion. It always affords me great pleasure to attend the Annual Meetings of this Institute, but I scarcely know on what grounds I should be called upon to return thanks upon the present occasion, unless it be, that I am perhaps the greatest offender of any member of the Council. I have been, I am sorry to say, very irregular in my attendance, but I can assure you, my Lord and this Meeting, that my inattention has not arisen from any want of interest in this Institute, or from any want of desire to promote its prosperity, but in consequence of numerous other engagements; and I have found it a very great loss to myself that I have not been able to attend more regularly. I rejoice, however, very much in the prosperity of this Institute. In consequence of some remarks that have been made, I have been referring in my own mind to the early days of the Institute, when an honoured friend, who is now no longer with us, in conjunction with myself and some others endeavoured to establish this Society; we soon had 170 members, as stated; and I recollect upon one occasion saying that I hoped the time was not very far distant when we should have 800 or 1,000. We have now come up to 800, and I have strong hopes that before very long we shall have 1,000. I think there are many reasons why we should congratulate ourselves upon the success of the Institute. Some have already been referred to. One is the fact, that notwithstanding the commercial depression of the past year, which almost all classes have felt, our numbers have not only been maintained but increased, and that both commercially and numerically we stand in a better position than we did last year. I also rejoice that this Institute is no longer a London institute. It has been very valuable in London; but it is increasingly and tenfold more valuable in distant parts of the world, where men have not the opportunity of going to libraries and consulting standard works as in this country; and I believe that those who possess the *Journal* of this Institute, possess an encyclopedia of useful knowledge which is invaluable. I fully endorse the remarks of our friend here, Sir Joseph Fayrer, as to the practice of denouncing scientific men as infidels, and whenever that is the case I raise my voice against it. I think it cannot be too widely known that we have many of the most scientific, able men, of the present day, who have been the most able Christian advocates, and we have the strongest evidence that they believe in the doctrines which they teach—such men as Faraday and Brewster, and many others that might be named I think fully bear out this—and we have one in our admirable lecturer here this evening. I will not trespass further upon your time. I beg to thank you very much in the name of the Council for your very kind vote of thanks. One word before I sit down. I attribute a great deal of the prosperity of this Institute, in fact all of it, to the admirable management of our honorary secretary. (Cheers). One of our most active members to whom I have referred, Mr. Reddie, was taken from us, and we were afraid we should not get any one to fill his place, but a kind Providence raised up

our honorary Secretary, and since that time he has worked with indefatigable zeal and with very great success. (Applause.)

Dr. C. B. RADCLIFFE then delivered the Address.

Dr. RADCLIFFE, in commencing his address, stated that he was taking the place of another, Professor G. G. Stokes, F.R.S. (Lucasian Professor of Mathematics at Cambridge).

[It is necessary here to mention that in 1878 Professor Stokes had kindly consented to give the Address at the Annual Meeting in 1879, intending to take as his subject, "The Nature and Limitation of Scientific Inquiry." As the time drew near Professor Stokes—having in the interim been placed on the Universities Commission—found himself so pressed for time as to render it impossible for him to fulfil his engagement with the Council; under these circumstances Dr. Radcliffe, one of the Vice-Presidents, most generously undertook to prepare an Address, although at a period of the year when his heavy professional duties made the greatest demands upon his time, he had therefore to prepare the address under very great disadvantages, and consequently in a manner unsatisfactory to himself, and he has since specially asked permission to withdraw from publication what he had so prepared. The Council feel, however, that Dr. Radcliffe, by the kind and generous way in which he, at a short notice, sought to supply the pressing need of the Session, has indeed earned for himself the special gratitude, and hearty thanks of every Member and Associate.*]

Mr. JAMES BATEMAN, F.R.S., in rising to move, "That our best thanks be presented to Dr. Radcliffe for the Annual Address now delivered, and to those who have read papers during the session," said:—My Lord, I have been requested to move this resolution, and I need not say I have great pleasure in doing so. Dr. Radcliffe's Address, I think, has greatly added to our knowledge of the tides; but, at the same time, we must not allow ourselves to forget that there is another tide, an inexorable tide, the tide of human time, which is still flowing, and which has begun to beat upon the beach of ten o'clock; and therefore I think it is almost time that we should move ourselves and beat a speedy retreat. One remark I would venture to make in connection with Dr. Radcliffe's Address,—he said that science and religion ought to be excellent friends, united and wedded together. It has hitherto been, and, I trust, will always be the office of this excellent Institute thoroughly to elucidate the truth, and thereby remove all stumbling-blocks, so that science and religion may be in harmony.

Mr. D. HOWARD, F.C.S.—I have very great pleasure in seconding the vote of thanks to Dr. Radcliffe for the Annual Address now delivered, and to those

* Professor Stokes has since read a paper before the Institute, and it will appear in this volume.—ED.

who have read papers during the session. I am sure all of us must have listened to and followed with great interest the remarks which Dr. Radcliffe has made—remarks which tend to make us think still more deeply of the mysteries of nature around us—mysteries which are rendered very simple in small manuals for board schools, but which are very difficult indeed to fathom when you look at the difficulties which really present themselves. Science certainly has not made nature plain; science certainly has not taken away the need for a belief in an omnipotent and omniscient Creator; in fact, the more we study science the more we feel that something more than human knowledge, something more than intelligent matter, is needed to account for all we see around us. At this late period of the evening I will not say more upon this subject, except that I think all of us must cordially join in this vote of thanks to those who have given papers during the past session; and if we give a vote of thanks to those with whom we agree, we should also give a vote of thanks to those, if there be any, with whom we do not agree; because this Institute has not attained to that height of excellence assumed by sceptics, where no departure from scientific orthodoxy is allowed, where the student is left without the slightest free will. Perhaps we can allow freedom of thought in science with greater ease than those who have no strong foundation upon which to build, no anchor fastly moored at which they may safely ride, and round which they can swim. I hope that all the members of the Victoria Institute have such an anchor and such a foundation.

The resolution was carried unanimously.

Admiral E. G. FISHBOURNE, R.N., C.B., in moving, "That the thanks of the Meeting be presented to the President," said: It properly devolves upon me to do so, seeing that I am the oldest member now of the Institution. I was at its inception, and I know the difficulties we had, and the debt we owe to Lord Shaftesbury for having, notwithstanding his many labours, undertaken to act as our President. We all know the broad expanse of thought his Lordship expressed concerning this movement,—that Christianity had nothing to fear from science; the fear was rather about too little science than too much; and if we consider every attitude of those most hostile, calling themselves essentially scientific, we see it is because they are unscientific that they are opposed to Christianity. (Hear, hear). Christianity is essentially an experimental science, and more experimental I will venture to say than any specially-called experimental science. Every Christian is a man who is the possessor of the Divine life, and knows it, and knows it as truly as he knows his own existence; and therefore he has an experimental knowledge that no man can have concerning abstract science. That was the view his Lordship took, and pressed it; and I think that is one reason among others, why he has so succeeded in forwarding this Society. The broad view he took in setting forth its objects, is entitled to our fullest and our warmest acknowledgments. Therefore I have very great pleasure in proposing this vote of thanks.

Dr. J. A. FRASER, M.D., Inspector-General of Hospitals;—seconded the motion, and said, that it was unnecessary in the present day to say anything regarding Lord Shaftesbury, as he was well known throughout the length and breadth of the land.

The resolution was carried by acclamation.

The Earl of SHAFTESBURY said: It is really very kind of you to propose to give me a vote of thanks. I have no claim whatever to it beyond the fact that I have been President of the Institute from its commencement in a small back room in Sackville Street, when there were, I think, five, but certainly not more than six, people present. But now it has grown up from a small beginning to great results, and if ever I could be persuaded to believe in the doctrine of evolution it would be in the rise and progress of the Victoria Institute. If I was as wise as Solomon, and wiser than all the wise men of the East put together, I certainly would not, if I had the power, detain you by any remarks at this late hour. I have not the capacity to do so at this or at any other time of the night. I would observe that we have reason to be thankful to this Institute; it has fulfilled all the conditions on which it was founded, and it has fulfilled another condition, which new condition is no longer necessary. I remember perfectly well that one great object of this Institute was to give to a great number of men of strong and powerful intellect, selected from the great and dominant intellects of the day, an opportunity of expressing their opinions and giving to the world the results of their meditations and their knowledge. But you must know that at the beginning of this Society there were certain dominant speakers who kept all power of competition from other speakers, and we were determined that those persons who could compete with them should come forward, to prevent the sole possession of knowledge on one particular side, and give fairness to the other side. One object was, that the Bible should be allowed to tell its own story, to say what it did say, and not be made to say what it did not say; and that people should express their opinions without being put down by the hoof of authority. We have carried that to a great extent. This Society wants no further protection. It is well-established in the opinion of the world,—in America, on the Continent, and in all parts of the civilized globe; and we may thank God that it is going on conquering and to conquer. I think we ought to say a word for our good friend, Captain Petrie, for no one has been more successful in conquering than he has.

[The Annual Meeting being concluded, the Members, Associates, and their friends assembled in the Museum, where refreshments were served.]

ORDINARY MEETING, DECEMBER 1, 1879.

**THE REV. ROBINSON THORNTON, D.D., VICE-PRESIDENT,
IN THE CHAIR.**

The minutes of the last meeting were read and confirmed, and the following elections were announced :—

MEMBERS :—Captain F. W. Annesley, King's Lynn ; W. Bickford-Smith, Esq. (Life), Helston ; F. S. Bishop, Esq., M.A., Swansea ; Colonel J. T. Griffin, F.R.G.S., Adamson ; Rev. C. H. Hagger, Ph.D., Queensland ; Rev. Professor A. Hodge, D.D., United States ; the Right Rev. the Bishop of Honolulu ; the Right Rev. Bishop Kelly, D.D., Liverpool ; the Ven. Archdeacon McDonald, Canada ; S. Smith, Esq., M.R.C.S.E., L.S.A., &c., Bristol ; J. Smith-Kirk, Esq., M.A., Ph.D., M.C.P., Wales ; Rev. A. Stokes, M.A., India ; Rev. J. Strachan, M.D., India ; Rev. J. Stern, D.D., London ; Rev. J. Thomas, D.D., London ; Rev. J. Welland, B.A., India.

ASSOCIATES :—Sir H. Barkly, K.C.B., G.C.M.G., F.R.S., London ; H. Barker, Esq., Huddersfield ; Rev. Professor R. J. Bell, India ; Rev. J. Bennett, M.A., London ; Rev. T. Bomford, M.A., Cambridge ; Rev. A. R. Cavalier, Ceylon ; Rev. F. W. C. Chalmers, B.A., Kent ; Rev. J. M. Clark, M.A., Nuneaton ; Rev. R. Cooper, M.A., Lincolnshire ; Rev. P. A. Ellis, India ; Rev. F. Exton, M.A., Brigg ; Rev. J. Finnemore, Manchester ; Rev. A. R. Gregory, B.Ph., London ; Rev. A. Gedge, Louth ; W. J. Grane, Esq., London ; Rev. A. Gray, M.A., Hereford ; R. Hughes, Esq., Brighton ; Rev. G. Karney, M.A., Isle of Wight ; Ven. Archdeacon Kaye, M.A., Lincoln ; A. Keene, Esq., Tunbridge Wells ; Rev. G. H. Kirwood, M.A., Hereford ; J. G. Langham, Esq., Uckfield ; J. A. McPherson, Esq., LL.D., Gloucester ; Rev. T. P. Methuen, M.A., Bath ; Rev. S. Morley, India ; Rev. R. C. Oake, Cheltenham ; Rev. C. Oldfield, M.A., Stamford ; Rev. H. D. Pearson, M.A., London ; Rev. F. W. Ragg, M.A., Kent ; A. Richardson, Esq.,

Birmingham ; Rev. G. Scratton, Louth ; A. Stewart, Esq., Australia ; Rev. J. H. Taylor, B.A., Andaman Islands ; Rev. J. C. Walter, B.A., Horncastle ; Rev. J. T. Waller, A.B., Ireland ; Rev. M. Erie Welby, M.A., Knighton ; Rev. W. D. West, D.D., Epsom ; Rev. J. E. Winning, M.A., M.R.C.S.E., Gloucester ; Miss A. Churchill, Blandford.

HON. CORRESPONDENTS AND LOCAL SECRETARIES :—Rev. J. W. Beaumont, D.D., Canada, Right Rev. Bishop P. C. Claughton, D.D. ; Rev. J. C. Hudson, Horncastle ; T. Johnson, Esq., Macclesfield ; C. Plummer, Esq., Canada ; Rev. N. Willis, A.B., Gravesend ; Rev. W. N. Willis, New Zealand.

Also the presentation of the following Works for the Library :—

“Proceedings of the Royal Society.”	<i>From the same.</i>
“Proceedings of the Royal United Service Institution.”	<i>Ditto.</i>
“Proceedings of the Royal Geographical Society.”	<i>Ditto.</i>
“Proceedings of the Royal Institution.”	<i>Ditto.</i>
“Proceedings of the Royal Colonial Institute.”	<i>Ditto.</i>
“Proceedings of the Geological Society.”	<i>Ditto.</i>
“Proceedings of the Society of Biblical Archaeology.”	<i>Ditto.</i>
“Proceedings of the United States Geological and Geographical Survey.”	<i>Ditto.</i>
“Proceedings of the American Geographical Society.”	<i>Ditto.</i>
“Proceedings of the American Philosophical Society.”	<i>Ditto.</i>
“Proceedings of the Canadian Institution.”	<i>Ditto.</i>
“Proceedings of the Smithsonian Institution.”	<i>Ditto.</i>
“Proceedings of the Barrow Naturalist’s Field Club.”	<i>Ditto.</i>
“Proceedings of the Report of Council of Americanists.”	<i>From F. Allen, Esq.</i>
“Forty Years in New Zealand.” By Rev. M. Buller.	<i>From the Author.</i>
“Brachiopodes.” By Professor Barrande.	<i>Ditto.</i>
“How to Work the Microscope.” By Prof. Lionel Beale.	<i>Ditto.</i>
“Fibrin.” Dr. Goodman.	
“Darwinian Theory Examined.” By F. R. Waring, Esq.	<i>Ditto.</i>
“Miracle no Mystery.” By Rev. H. Barker.	<i>Ditto.</i>
“Grouping of Rocks in Devon.” Professor Jukes.	<i>Capt. F. Petrie.</i>
“Medical Times.”	<i>Dr. J. A. Fraser, I.G.H.</i>
“London Quarterly Review.”	<i>A. M’Arthur, Esq., M.P.</i>
“Twelve Sermons.” By Rev. R. Main.	<i>W. H. Ince, Esq.</i>

Also several pamphlets from the Rev. E. Bell, Mr. Coutts, Prof. Hughes, M. Lombard, Rev. T. Mooney, Dr. Palmer, Rev. S. Potter, Dr. S. Smith, Bishop Titcomb, and Dr. J. M. Winn.

The CHAIRMAN :—Before the paper to be taken this evening is read, I would venture to remark that attacks in the name of Science upon the truths of the Christian Religion have been fewer of late ; it would seem as though those who sought to drag science to their aid in attacking religion are getting less united, and are beginning to find that their scientific theories are but theories, and that they are irreconcilable one with another ; in fact that their Science is as uncertain as they would make out our Revelation to be. The great strife between Haeckel and Virchow is fresh in our memories, and I fancy the rift that has shown itself there may not be confined to any particular branch of scientific inquiry. Four or five years ago such people spoke of the Scriptures as an old book which intellectual people had agreed to scatter to the four winds, as being unreliable ; they are now beginning to moderate their tone and recognise that those who regard the Scriptures as true are worthy of respect, and may after all not be so entirely in the wrong, or so unscientific ; and in bringing this about I would fain believe that this Institute, which in a few years has grown from a Society of 200 to one of more than 800 members, has borne some part.

The following paper was then read by the Rev. T. M. GORMAN, M.A., the author being unavoidably absent :—

PHYSIOLOGICAL METAPHYSICS. By NOAH PORTER,
D.D., PRESIDENT OF YALE COLLEGE, UNITED STATES.

THE phrase Physiological Metaphysics is selected simply for precision, because no other expresses our meaning so well. We do not intend by it any single or special science, as when we speak of the science of mechanics, or optics, or chemistry, or geology, or of any other subject-matter, whether physical or psychical. Nor do we use the word collectively for the systematized or interpreted knowledge of several classes of objects, as when modern science is spoken of, and usually though improperly made to include only those sciences which have matter for their sphere. We believe most fervently in science, in each and all of these senses ; we rejoice in its progress ; we confide in its methods, and are not afraid of the direct or indirect results or any of its discoveries concerning man, the universe, or God. We loyally accord to it independence and supreme authority within its sphere.

Nor do we intend by it physiological science, or that science

which has life and living beings for its sphere of inquiry. This science we delight in, most of all the sciences of nature, for the reason that the scientific study of life is the best preparation for and the best introduction to the study of the soul, inasmuch as it effectually disciplines man to do justice to psychical phenomena and all the beliefs and relations which they involve, by first confronting him with the mysteries of life, and then introducing him to those higher phenomena of conscious experience and activity from which these are yet sharply distinguished.

We would not be suspected for a moment, by the use of this phrase, of throwing any discredit upon metaphysics proper; which term and the science which it designates both need all the good words which can be said of them in the evil days of criticism and disesteem on which they have fallen in many so-called scientific circles.

We believe in metaphysics or philosophy, both in the narrow and the enlarged conceptions of the same, whether the words signify the conceptions and principles which must be assumed as the foundations of every special science, or whether they stand for a still more extensive sphere of truths concerning man, nature, space, time, and God, which are partly necessary and partly inductive. We would not therefore be understood as calling in question metaphysics as such, or of availing ourselves of any general disesteem in which the term is often used to the damage of that form of speculation which we have in mind, and which we call metaphysics by eminence.

Our theme is physiological metaphysics. We call this science metaphysics because it proposes a system of ultimate formulæ for the explanation of the origin and history of the universe, which it uses as the clue to our scientific knowledge of the same. We call it physiological, because the special science of physiology has furnished its distinctive conceptions and principles, and fixed its terminology. Its representatives and defenders have stigmatized much of the current metaphysics as theological, on the assumption that in some sense it had illegitimately borrowed its principles and methods from positive or Christian theology. With much greater propriety we may use the phrase physiological metaphysics of a system in which physiological relations are made supreme, and for which to a large extent they have furnished the terminology. We do not object to the recognition of physiological conceptions in the domain of metaphysics. Every science, so far as its subject-matter is unique and furnishes conceptions and relations that are peculiar to itself, must have what we may

relatively call a metaphysics of its own. Accordingly, we speak with entire precision and propriety of a mathematical, a chemical, and a physiological metaphysics. Used in this sense the term has a legitimate signification. Nor do we in the least except against the recognition of development or evolution as a legitimate conception or law in any class or sphere of phenomena, so far as its presence and agency are sustained by observation or verified by experiment. The true philosopher will as rationally and as readily believe in development or evolution, either as a force or a law, as he will believe in mechanical adhesion or chemical combinations, or the laws which govern either. He will not even object to the explication of any number of phenomena by means of evolution, provided the evidence for this application is satisfactory and the experiments are decisive. Nor will he object to relying on analogy as a ground of believing in evolution beyond the range of observation or experiment, provided the data of facts are sufficiently numerous, and the analogies compel to this sole conclusion.

It is only when *evolution* or development is taken out of its definite and legitimate applications within the domain of life, and extended to every description of beings and phenomena, from the inorganic on the one hand to the self-existent on the other, that we question the warrant for applying the relation so widely and to a subject-matter from which it is wholly foreign. That a form of metaphysics is current, which in the sense defined may properly be called physiological, cannot be questioned by any person who is superficially acquainted with the philosophizing of our times. Its growth has been rapid and its development has been, to use its own favourite term, almost as sudden as was the first rushing of star-dust into the first solid orb. The elements of which it is composed are singularly incongruous, and the writers who have contributed to its popularity and its acceptance are strangely unlike. Some of the principles and philosophies which it has contrived to subdue to its own vital power are seemingly irreconcilable, and yet they all have been gathered somehow into a common school of thought, which is regarded by many as mechanical, materialistic, and atheistic on the one hand, while it claims on the other to do full justice to the phenomena of spirit and the mystery of the Infinite. The menstruum which it employs as a solvent for these apparently unrelated and intractable elements is its doctrine of life. Whatever may be the defects or incongruities of this bold and sweeping theory, whatever are the dangers it brings to faith and morals, to social order and religion, it hides in part by the elevated associations which

the mystery of life never fails to suggest. Development and evolution have become terms convenient for the enchanter or juggler to conjure with in the haunted caves of metaphysical subtlety ; and it would seem at times as though, whether it be enchantment or jugglery, the first victim of either is usually the operator himself.

The writers who have most effectually contributed to the maturity and exposition of this system are, Mill the father and Mill the son, Alexander Bain, John Tyndall, Thomas H. Huxley, Charles Darwin, Herbert Spencer, George H. Lewes, and John Fiske.

Besides these we ought not to overlook the crowd of naturalists, both the solid and romantic, who, having accepted the evidence for evolution within certain limits, are ready to extend it indefinitely over all regions of knowledge that are unfamiliar to themselves or in their nature not easily grasped, and are content to make it the substitute for the absolute, the infinite, and the living God. Were we to assign to each of these writers we have named the element which he has contributed to this new metaphysics and the agency which he excited, we must needs write a careful criticism and a philosophical history of the theories of each of these eminent men. It will be enough to say that James Mill's bald and yet half-digested sensationalism ; John Stuart Mill's exposition of induction, his Comtian theory of causality, together with his necessitarian and sociological ethics, and his doctrine of associationalism as contained in his criticism of Hamilton ; Alexander Bain's gross physiological cerebralism, and his thorough-paced associationalism, in which he surpasses even Stuart Mill himself ; Thomas H. Huxley's doctrine of protoplasm as the physical basis of life ; Michael Faraday's brilliant suggestion of the correlation of force, confirmed by numerous experiments on the part of careful followers, which has been so brilliantly expounded and so daringly applied by the eloquent John Tyndall ; Charles Darwin's doctrine of the origination of species by the law of natural selection under the conditions of a favourable or hostile environment, and his doctrine of heredity as subsequently enounced ; Herschel and Laplace's nebular hypothesis ; the Kantian doctrine of the relativity of knowledge as interpreted by Hamilton and applied by Mansel —were all more or less distinctly before Mr. Herbert Spencer when he matured the romantic generalization by which he explains the generation of the universe of beings—mechanical, physical, spiritual—under the formula of development or evolution, and assumed for it a steady and continuous progress from the simple to the complex, attended by a constant ten-

dency to integration, which gives relative permanency to its transitory phases. This law he makes to extend to every thing which exists and to every event which occurs; to beings material, vital, spiritual; to every occurrence or change which befalls them; to the gathering of the cosmical masses, and the falling of a sparrow; to the suggestion of every thought, and the inspiration of every emotion: it even holds of the subtle relations which underlie all science, and declares that these are first evolved by manifold experience, then hardened in the brain by the repeated blendings or consentient activities of many brain-cells, and finally transmitted as the necessary forms and regulators of the psychical—*i.e.*, cerebral—activities of subsequent generations. The system thus perfected has been expounded in more or less detail by not a few zealous disciples, who have now and then sought to apply it with greater exactness than their master. It has been accepted in part by some who would hesitate to assent to it as a whole, but who nevertheless confidently reason as though the formulæ of evolution were the ready solution of many a problem, and find in continuity, heredity, and development the keys which open many a lock. It is not essential to follow it in detail in order to judge of its characteristic peculiarities. We are only concerned to show that the metaphysics which makes such magnificent claims, and in one sense has reached such magnificent proportions, is essentially physiological in its fundamental conceptions. This is distinctly asserted by Mr. Spencer himself.

" And now let me point out that which really *has* exercised a profound influence over my course of thought. The truth which Harvey's embryological inquiries first dimly indicated, which was more clearly perceived by Wolff and Goethe, and which was put into a definite shape by Von Baer—the truth that all organic development is a change from a state of homogeneity to a state of heterogeneity—this it is from which very many conclusions which I now hold have indirectly resulted. In *Social Statics* there is everywhere manifested a dominant belief in the evolution of man and of society. There is also manifested the belief that this evolution is in both cases determined by the incidence of conditions—the actions of circumstances. And there is further, in the sections above referred to, a recognition of the fact that organic and social evolutions conform to the same law. . . . The extension of it to other kinds of phenomena than those of individual and social organization is traceable through successive stages. . . . Afterwards there came the recognition of the need for further limitation of this formula; next the inquiry into those general laws of force from which this universal transformation necessarily results; next the deduction of these from the ultimate law of the persistence of force; next the perception that there is everywhere a process of Dissolution complementary to that of Evolution; and, finally, the determinations of the conditions (specified in the foregoing essay) under which Evolution and Dissolution respectively occur. The filiation of these results is, I think, tolerably

manifest. The process has been one of continuous development, set up by the addition of Von Baer's law to a number of ideas that were in harmony with it."*

This distinct avowal would decide the question, if any question were possible, that the relations which are characteristic of Spencer's system are prevailingly physiological.

Whether Spencer's view of what life is, and of its genesis and conditions, may not be seriously defective, we shall not at present inquire; whether he may not have formed an inexact and superficial view of development itself, as held by Goethe and Von Baer, or made an illegitimate and unauthorized application of the term as understood by them, we need not ask,—it is enough for us to know that the conception as at present employed was derived from the processes of life, and was originally limited to the sphere of organic existence. While we take Spencer as the representative of the extremest views, we know that multitudes agree with him in holding the physiological metaphysics who would shrink from making so bold an application of the principles which they involve. But we think it not unjust to subject to the same test the principles which they all hold in common.

This system claims to be the apotheosis of science and of philosophy, in that it has brought it to its final culmination and its ultimate possible perfection. As such it asserts that it has invested the universe with the radiance of a single interpreting formula, and has penetrated its darkest abysses with scientific light. It resolves all the phases of its past, tracing them in order from the beginning when star-dust was found to be moving out of chaos from a rarer to a denser medium, on to the end when all the possible cycles of development having been completed, and every stadium of progressive integration and differentiation having been accomplished, the ultimate particles shall be released from these bonds, when the scene is to shift, and star-dust somehow shall reappear on the arena passing from a rarer to a denser medium, and the cycle of development shall again be renewed.

We do not propose to enter into an extended discussion of this system. We are well aware that the public, for several reasons, are weary of these minute and extended criticisms. Prominent among them is this: that few persons are so familiar with each of the several lines of argument in which lies its strength if it be true, and its weakness if it be false, as to be

* Essay on Reasons for Dissenting from the Philosophy of Comte, appended to an Essay on the Classification of the Sciences. Pp. 46, 47.

able to judge of any considerable number. Fewer still are competent to pronounce upon the relation of each part to every other, and the cumulative force of all as they bear upon the grand conclusion. What is within the sphere of each man's specialty he can understand. What is derived from the sphere of another's observation or thought he must take in some sense upon trust. The general similarity between the several relations and facts of the several spheres any man can vaguely appreciate, and hence the generalizations of the theory seem plausible at their first impression, though the impression is vague, and perhaps because it is vague. Meanwhile the confiding student trusts to the brilliant suggestions of the confident theorist and his more confident asseverations. So long as he is in the attitude of a learner, the path is easy; but so soon as he is summoned to the duty of the critic his task is difficult and irksome, because he must of necessity pass judgment upon subject-matters with which he is not familiar, and in respect to which he feels that he is incompetent to act as a judge. That many physiologists should favour a system of philosophy which finds development everywhere is not very surprising. That those who are not physiologists in special should at first hesitate, and know not what to say, and then be dazed by the imposing plausibility of the generalizations which they cannot fully appreciate, and finally relapse into a "silence which is taken for consent," seems at first thought surprising, but on second thought is altogether natural. Explain the fact as we may, the theory takes captive many a general student and otherwise critical thinker simply because he is unable to reply to the reasonings on many points which are out of the range of his studies. And yet the breadth of the generalizations, the confidence with which they are urged, the nonchalance with which difficulties are surmounted, the vast number of facts which the expounder has at his command, the ease with which he marshals them under groups, and, above all, the mysterious fascination with which the phenomena of growth and change are invested to every imaginative mind—all these account, in part, for the unquestioning acceptance of the theory by many quick-minded thinkers who would confess themselves altogether disqualified closely to scrutinize its claims. It is obvious that those who, for the reasons given, cannot understand the arguments for, are disqualified to understand the arguments against, and hence special and minute criticisms of these pretentious and portentous theories attract attention from but few.

There is one line of argument, however, which is accessible to every mind. It concerns itself with the relation of this

theory to the certainty and the trustworthiness of science itself. If it can be clearly proved that the physiological metaphysics by its own showing is fatal to the authority and trustworthiness of knowledge itself in all its forms, and especially in the processes and the conditions which are essential to science, it would seem that a system which had claimed for itself, and had seemed to many to be the apotheosis of science, has committed theoretical suicide. It is our purpose to show this by arguments and illustrations which are open to the understanding of any one who is capable of judging of subjects of this kind, or will be likely to be interested in the question. So far as the teachings of this system are concerned with the authority of and trustworthiness of science, they relate to four distinct topics—viz., *the process of knowledge, the agent in knowledge, the conditions of knowledge, and the sphere of knowledge*—whether this last be the finite universe or the something more, called the infinite, the absolute, or God.

(1.) We begin with the process of knowledge, because science as a process is a form of knowledge which passes into a product. It is also, as process and product, one of the highest and noblest. Any view of the process which is seriously defective in any particular must vitiate our conceptions of the product by weakening or destroying the grounds of our confidence in the structure which it builds for us. A fatally defective or inconsistent theory of knowledge must be suicidal to science. It is then a matter of fundamental interest to know what the physiological view of knowledge must be according to the theory of the evolutionists, and what it is defined to be by themselves.

We ask, first, what it must be according to the theory of the evolutionist? We answer it must be a phenomenon resulting from the differentiation and integration of two preceding phenomena less complex than itself. We may not refer to a knowing agent as its sole originator, because such an agent that exercises the function of certainty and distinguishes it may be the object known from itself, the knowing spirit, is an inadmissible conception. Evolution recognizes no single agent in any process. It requires at least two simpler forms or phenomena, *i.e.*, modes of the unknown and unknowable force. These must interact, as seed and sunshine, as the nucleus and protoplasm, as nerve-cell or stimulant, in such a way as to evolve a *tertium quid* different from and more complex than either. Let us suppose that a phenomenon of this kind, thus evoked by its consenting forces, and sustained in being only

so long as they conspire in energy, has reached so high a position of differentiated integration in a happily-constituted and thoroughly-cultivated brain, as to take the form of a completed theory of evolution. The theory is demonstrated to the mind of an ingenious philosopher. In scientific language, it floats in a delightful equipoise of consilient if not jubilant brain-cells in the roomy head of its forever famous originator. It also finds entrance and makes place for itself in very many other nervous organizations sufficiently differentiated to give it an answering response of favour. As long as these agencies continue in this happy and consentient reaction, the science of evolution is accepted as true. But the progress of development by its own showing can never rest. No more can any process which we commonly call certainty or conviction of truth, the exciting agents which in the vulgar speech men call evidence, but in scientific nomenclature we must call highly differentiated and compactly integrated nerve-cells, which represent the theory to be received and the responsive molecules which in common speech are unphysiologically supposed to represent a conviction of its truth—neither of these agencies can linger long in the happy condition of equilibrium which they have attained. Under the onward and upward pressure of manifest destiny, they must proceed to other integrations and differentiations which, whether they be beings or phenomena, must be unlike those which have preceded them. That phenomenon which may remain for a while—call it certainty, conviction, knowledge, science—long enough to buoy up the magnificent theory of evolution, according to the theory and under the operation of evolution itself, can have no permanent existence, and of course no final and universal authority. Or if certainty is still accorded to the lower rank of agencies just left behind, the knowledge and the truth, the subjective conviction and the objective reality, may both be superseded by some other combination of agencies which is totally unlike that which has previously come into being. This is no caricature of the theory, but the strictly scientific application of its principles. For according to its teachings every thing is phenomenal, even the function of knowledge itself. Every phenomenon is brought into being and sustained in being, and is what it is as a being, by the consentient action of the agencies which are concerned in its production. Behind every act of knowledge and into every act of knowledge the whole universe of force somehow appears. What the phenomenon is must depend on the character of the agencies from which it is evolved. If the agents change in their so-called constitution, the reactions must change with them. This must be

true of all the forms of knowledge from the lowest to the highest. It must be pre-eminently true of the highest as yet attained by man, the knowledge which is science and which gives science.

Should this view of the matter strike any of our readers as singular and strained, it must be because they have not reflected on the reach and import of this theory of evolution when it is applied to the function of knowledge. The function itself, as we know it in our experience, is so totally unlike anything of this sort that we cannot believe that any theory can teach so defective a conception of its nature as the one we have described. Or it may be we carry the convictions which we derive from our conscious exercise of the act of knowledge over into our interpretations of the consequences which any theory would logically involve. It must also be confessed that the language and representations of much if not of most of our English psychology give more or less sanction to those views of knowledge which the physiological metaphysics have only carried to an extreme in one direction, which they somehow have thought to correct in the other by introducing from the world of life the more elevating conceptions of development. It is notorious that the drift of English psychology since the time of Hobbes has set very strongly in the direction of the passivity of the mind. The well-known fact that in sense-perception physical agents or objects must act upon the sense-organs and the sensorium, in order that the material world may be known and the prominence given to the operations of the passive memory and imagination in the cerebral and associational schools, have sanctioned these gross misconceptions of the nature of knowledge itself. These in turn have prepared the way for theories which conceive the act either as an effect produced by the object known upon the knowing mind—in this reversing the order of nature and of experience, or represent it as a function in which the object and mind coact, the result being the outcome of their conspiring energies, as when the ball follows the diagonal between two impulses at right angles to one another, or as oxygen and hydrogen are developed by union into water. The leading evolutionists who venture any opinions on psychology do not hesitate to avow the grossest explanations of the mental processes which are matters of the commonest experience. Both Mr. Spencer and Mr. Huxley go so far as to accept the doctrine of Hume that the processes of knowledge are best expressed by Hume's "impressions and ideas," and seem to be sublimely unconscious that anybody who presumes to be a philosopher can hesitate to accept these as the last words upon the subject. These gross misconcep-

tions are not relieved from their logical consequences by being clothed in the more attractive garb of development or evolution, which is borrowed from the sphere of life. Especially if development itself is conceived as a progress from lower to higher potencies of mechanical aggregation, beginning with a crystal and ending with a spirit. Development suggests associations which are elevated and spiritual. For this reason it can be used more readily to dispute and dignify mechanical relations and laws. It suggests the variety, the resources, the beauty, the intelligence, the joy, and the rapture of living beings. It is invested with the associations of mystery, of independence and of self-reliance, which are connected with living beings, even of lower types. These associations serve very largely to explain the otherwise inexplicable fact that evolution, even when it has become atheistic or agnostic in its philosophy, has entered so easily and been entertained so graciously in scientific circles which are high in moral tone and devout in religious aspiration.

It is more than probable that the construction which we have placed upon the evolutionist theory of knowledge as necessarily suicidal to science, will be regarded as forced and unfair. The *reductio ad absurdum* from the logical consequences or consistencies of a definition or theory, though acknowledged to be theoretically just, is often rejected as practically unfair, especially if it can be urged that the advocate of a theory may perhaps not accept the definition or the construction which the critic imposes upon the doctrine which he assails. The defender or looker-on will not unfrequently interpose in the interest of fair play, and insist that the representative of the theory assailed shall be allowed to define and apply his own conceptions. It is always courteous and usually just to concede this claim. In the present instance the demand can be readily met, and the challenge may be most gratefully accepted. We have in his own language the theory of knowledge which is accepted and expounded by the great advocate of physiological metaphysics.

In Herbert Spencer's *Principles of Psychology* (Introd., c. v., vi., vii., part ii., chap. i.), this theory may be found by any person who will use the patience to search out its fragmentary and loosely-scattered elements, and carefully adjust them into a coherent whole. At first the concession is made, and as it would seem with astonishing naïveté, which almost wins the heart of the critic, not only that psychical phenomena are known by consciousness or introspection alone, but that science can neither discern nor prove any connection between them and any changes in the organism. After this naïve con-

cession of Mr. Spencer, which sends us to consciousness as the sole and final arbiter of what it is to know, he robs it of all its authority by asserting that even in sensation all that we can know of the relation of the changes in the nervous organism to its related conscious activities must be learned through the light which is thrown upon the operations of evolution in other spheres of being. This is at once to set aside the final testimony of consciousness in respect to the lowest form of knowledge in sense-perception, by referring the decision to a metaphysical or physiological theory. It is to set up a theory which professes to be founded on facts that are confessed to have no possible relation to the facts in question, to settle questions of fact and experience which are asserted to be utterly unlike those from which the induction is derived.

What the conclusion is which he reaches from this induction is very clearly though very indirectly stated thus: "Though accumulated observations and experiments have led us by a very indirect series of inferences to the belief that mind and nervous action are the subjective and objective forces of the same thing, we remain utterly incapable of seeing and even of imagining how the two are related" (§ 56, *Principles of Psychology*). This conclusion being reached, the author proceeds to show how they are related in sense-perception, i.e., how knowledge may be developed from or expressed in terms of nervous action. "Knowing implies something acted upon and something acting upon it." "That which in the act of knowing is affected by the thing known, must itself be the substance of the mind. The substance of the mind escapes into some new form in recognising some form under which it has just existed." He then argues that what seem to be the simplest sense-perceptions—i.e., alterations of the substance of the mind or subjective phenomena of nervous activity, as of sound, cannot be simple because we speak of their quality, *timbre*, volume, &c., mistaking here an ultimate or indecomposable experience of consciousness for the several relations which it may have to other experiences or acts. As we cannot find in consciousness the simplest element of this really complex experience we must look for it elsewhere. We finally find, or conclude, or conjecture, that it must be akin to a simple "nervous shock." We next find or infer that many simple nervous shocks are the essential counterpart or objective side to which the simplest experience of consciousness in sensation corresponds. We conclude, then, that "the nerve-pulses and the pulses of feeling clearly answer to one another, and it can scarcely be doubted, that they do so throughout." If next we apply to the teachings of chemistry concerning matter in

order to gain light as to the way in which these complex pulses of feeling may be accounted for, we find that complex and dissimilar material agencies are produced from various combinations of simple particles, and that in the last analysis the so-called simple substances are built up of various combinations of one primordial form of matter. This leads us to conclude by analogy that "the multitudinous forms of mind known as different feelings may be composed of simpler units of feeling, and even of units fundamentally of one kind." To the objection that this would obliterate and set aside the distinction between mind and matter, the author replies that, as we know nothing of the essence of either it is of little consequence whether we define the phenomena of matter in terms of mind or the phenomena of mind in terms of matter. Upon this we make the single comment that whether this be so or not it is of the utmost consequence that that process or operation which we usually call knowledge—the process by which science is built up and upon the trustworthiness and authority of which science depends—should be rightly conceived. If knowledge, when rightly interpreted, is resolved into a series of nervous shocks to which correspond a series of experiences that are felt, we cannot but inquire what meaning or authority is there in the shocks and accompanying feelings that are expressed in the words, "I know by analogy or believe that the doctrine of evolution is true;" or what assurance we have that what we call our present conviction on this subject, which we are informed is rapidly becoming the accepted creed of the present generation, will be retained in the generation that is to come after?

Our misgivings are increased as we follow Mr. Spencer's analysis of knowledge as experienced in consciousness. "The proximate components of mind," he tells us, "are of two broadly contrasted kinds—feelings and the relations between feelings." We accept this without either questioning or criticism, as being the equivalent of the mind's conviction that Mr. Spencer's doctrine of evolution is true—*i.e.*, it apprehends certain conceptions in certain relations—the conceptions being the subject-matter, the relations being the discovered truth or probability of this subject-matter. We are almost overjoyed by the anticipation that we are to learn at last what he thinks of the operations of the higher intellect in discerning relations. It is a commonplace with other philosophers, and pre-eminently with all modern scientists, that the relations of phenomena are all with which science concerns itself; that the higher intelligence is employed solely in discovering and comparing them. We turn over the leaf with eager if not with agitated curiosity,

to learn what the physiological metaphysics have to say upon this point. We scarcely pause to notice Spencer's definition of the feeling as giving us the materials between which relations are discerned. We observe in passing, however, that "a feeling, as we here define it, is any portion of consciousness which occupies a place sufficiently large to give it a perceptible individuality,"—i.e., in common speech it is the act of apprehending the minutest element or object that can be distinguished. But what is a relation as of likeness, or identity, of causation, or adaptation or end? What and where does the mind find these subtle links of significance by which facts —called feelings by Spencer—are connected together into those combinations and grow into those structures which men call science, chief and noblest of which is the science of sciences, the physiological metaphysics, of which Development is the charmed word? Listen to the answer: "A relation between feelings is, on the contrary, characterized by occupying no appreciable part of consciousness. Take away the terms it unites and it disappears along with them, having no independent place, no individuality of its own. It is true that under an ultimate analysis, *what we call a relation proves to be itself a kind of feeling—the momentary feeling accompanying the transition from one conspicuous feeling to an adjacent conspicuous feeling* (§ 65, *Principles of Psychology*). Here we have the key to the physiological metaphysics! The acts of discerning relations, the related objects, and the relations discerned are feelings. The sublime interpretations of the scientific mind, such as Kepler, and Newton, and Davy, and Faraday, and Kirchhoff have now and then achieved, and which have elevated them to such triumphant joy as only befits a moment of divine inspiration, and the analogies which they have discovered and applied — these, physiologically explained, are brief, inappreciable, and yet faintly appreciated emotions in the transitions from one feeling to another. But what is science if it rests on relations which are conceived after this fashion? Let the student of her history who knows what science has done and is now doing, ask whether this chemico-physiological explanation does justice to those acts of sagacious insight by which science has ascended to that lofty seat from which she dares either proudly to dispense with God or confidently yet humbly to read the thoughts of God? Whatever else may be true of the solutions which the physiological metaphysics give of other problems, they furnish no satisfactory explanation of the processes by which science itself has been evolved into being or of the authority by which she commands the assent of mankind.

(2.) Equally unsatisfactory are their representations of the agent of science, whether it be called the human intelligence or the human soul. It would seem as though any satisfactory metaphysics would of necessity exalt the agent of all these achievements to the highest possible position, and accord to it the noblest endowments and capacities. To do this has been the temptation of scientific thinkers in other ages. It has been reserved for the science of our time to show its extremest daring by its attempts to degrade its activities, and to crown that daring by efforts to dishonour or destroy the agent that performs them. It would seem that none but a modern scientist could be moved to sublime delight in looking back upon his individual self as once floating in the whirl of the original fire-mists, or rise to a feeling of exultation in looking forward to himself as flashing in the azure tints which drape a magnificent sunset. Nor have these conceptions of man's spiritual being been confined to the soarings of the scientific imagination. The reason has also used its utmost refinement of analysis and stretched analogies to the boldest theories in order to reduce the knowing agent to "a physiological expression" or a metaphysical abstraction. It is true that, in order to be successful, it must first avail itself of the mystery and magic which the common mind finds in the processes of life, exalting and magnifying them so high as to make them capable of spiritual functions, and then give both life and spirit a downward plunge by its mechanical theory of nervous shocks. If our readers will assure themselves that this representation is no exaggeration, let them carefully study the representations of the soul as they are reasoned out by Bain, or Spencer, or Lewes, or Fiske. Let them not be imposed on by the apparently candid and considerate admissions which they find in all these writers of the difference between physiological and psychological experiences, nor of the incommensurability of the one with the other. They will find that in the last analysis the so-called psychological experiences are only other names for states of the nervous system which, even in the terms by which they are described, are only removed by the faintest *nuances*, from mechanism and chimism, either in thought or language. As to the mind itself as known to itself, as exercising the authority of judgment or being convinced in certainty, there is not the hint that this is not only essential but conspicuous in the operation of scientific knowledge. The suspicion or conviction that there is or can be an agent that exists or acts in them all, is set aside by the suggestion that mental acts and the agent as known are but fleeting states or phenomena of the unknown force which now

appears as a knowable phase of what we call matter, and now as the knowing act of what we call mind, while of the nature of the two-faced force we can know nothing more than is given in these transient phenomena, while the permanent existence of the subject of either is simply the longer persistence of the force which manifests itself through either aspect of these bi-polar phenomena. To reach any scientific conviction would seem to require a mind to be convinced, but this philosophy knows no mind, but only a state that is correlated to a phase of the nervous system which is but another phase of other agents sublimated to or through higher removes of refinement, from the preceding simpler elements, or the simpler phenomena that went before. No explanation can be given of the plausibility of such a theory except that its theory of the soul is purely physiological. None of these most dexterous word substitutions or subtle interchanges of thought can be accepted as the equivalent for the emphatic assertion of its own being which the soul makes to itself in every step of its knowing, and which it emphasises more positively the higher it rises in scientific achievement.

(3.) We pass next to the conditions of knowledge in the apprehension of which the physiological metaphysics claims special advantages. It has learned, on the one hand, to recognize the necessity of certain categories which must be assumed as unquestioned and primitive in order that science may be possible, but cannot recognize them as either forms of being or forms of mind, because, according to the physiological theory, beings and mind are varying states or phenomena of the unknown force themselves which are more or less persistent, evolving one another by differences that divide and combinations that unite. There are relations, however, ever recurring, which mix with all our knowing and enter into all our experiences, and which accompany all our beliefs, and are especially conspicuous in the high generalizations of scientific thought. It is true that physiologically conceived, as has already been explained, relations are only feelings, more transient than the feelings between which they are said to exist—*i.e.*, are experienced in the mind's transition from one feeling to another. There are relations between complexes of feelings and also between complexes of relations. These relations, like all other mental experiences, involve certain definite activities of the nervous organism, which, if often repeated, tend to perpetuation. Let it now be supposed that certain relations, as of causation, or time and space, both in their specialized and more general forms, should often be

repeated—the molecular condition of the brain must be gradually adjusted accordingly. By the law of heredity the tendencies to these adjustments must pass over into the brains of the succeeding generation. By constant exercise these adjustments would be so fixed as invariably to recur when their appropriate conditions should require, attended by their accompanying psychical experiences, till at last, as the result of the accumulated force of these recurring and inherited experiences, it has become absolutely necessary to the intellectual activity of the human race as we find it to think under them as accepted categories of scientific knowledge. The physiological origin and character of this theory of the conditions of science are sufficiently obvious. Every element in it is purely physiological—the nervous activity as the counterpart of mental activity; tendencies often awakened and fixed in the brain by repetition; heredity by physiological transmission, and unconscious and necessary revival under every possible occasion. We do not assert that the theory, when physiologically viewed, is altogether coherent. Even though we should allow its principal assumptions to pass unquestioned, we do not find that it explains why so few of these relations between complex feelings or complex relations should originally present themselves so frequently as to thrust aside many others—why the relations of time and space or causation should gain any advantage by their frequency, were there not some original necessity that determined them to be frequently and even uniformly present to the discerning mind. But if any such necessity for their frequent occurrence be admitted, then it must have existed before the intermediate action of the physiological agencies that are introduced to explain the permanence and the universality of the categories that have thus become the intellectual outfit of the race. Then again, heredity, while it transmits with strength and certainty, also transmits with tendencies to variation; and the environment which receives the transmitted legacy of the past also fixes it with some discernible change. But this is contrary to the theory which holds the categories to be axiomatic and permanent.

If, on the other hand, we suppose the theory to be true, the consequences must be fatal to the authority of science itself. We see not why, under the operation of the physiological agencies supposed, new categories must not come into existence which may displace or perhaps contradict those already recognised—nor why any species of so-called relations may not come into being; nor why, under the operation of the inevitable tendency to change, the entire structure of axiomatic

relations which are now accepted should not be outgrown ; nor why, in short, science itself, as we know it, with its space and time, its number and magnitude, its causation and its adaptations, should not finally be dissipated into intellectual star-dust.

It would seem as though any system of metaphysics ought at least to provide for its own permanence and the solidity of the sciences which rest upon it. But when, instead of this, it supplies the materials and provides for the necessity of its own displacement, we cannot see why it does not commit a deliberate *hari-kari*, with no less certain and dreadful fatality because of the solemn state and heroic dignity with which it inflicts and accepts the final stroke.

One category or axiom is fundamental to the physiological theory which seems especially endangered, and that is, the assumption of the law of evolution itself as necessarily permanent. No man should claim to be a philosopher who has not asked himself the question and attempted to answer it, Why do I believe that the law of development which I observe to exist within a limited sphere of living beings, extends through the universe of being, or why do I assume that a mode of operation which has held good for many ages will continue for all the ages, or even has prevailed from the first ? The question is not answered satisfactorily by the physiological explanation of our fundamental beliefs. Mr. Spencer does not phrase it in the form which we have adopted, although he does very often concede that the evidence for our acceptance of the theory as universal and all-enduring is to be found in its universal presence and its capacity to explain all observed phenomena. But where this criterion of truth has originated he does not seem to consider. On his own theory it is a chance brain-growth which has become a fixed growth—an axiom of the mind, broad enough to underlie all forms of scientific research, and deep enough to sustain the structure into which they are wrought ; but how a conviction so fundamental should have gained convincing power by the simple repetition of its discerned exemplifications, it is not easy to see. But a metaphysics which does not seek to explain our belief in the fixedness of the course of nature can never satisfy a truly scientific mind. Such a system is not enlightened enough to ask all the questions which should suggest themselves to such a mind. It is not surprising that if it fails to ask them with intelligence it should be unable to answer them satisfactorily. So far as it may be said to ask any questions respecting the foundation of our faith in the physiological relation of evolution, it answers by phenomena

and analogies that are purely physiological, and even resolves these physiological data into forces and laws that are purely mechanical, translating our very faith in evolution into the harmonized movements of the brain-cells of the philosopher, and explains the movements of the brain-cells by the mechanical movements of the particles of which they are composed.

(4.) We notice, last of all, that the physiological metaphysics makes no provision for, or recognition of, the sphere of scientific inquiry in its full extent and completeness. There are certain conceptions and relations for the actual presence of which to the mind it can give no account; much less can it explain our beliefs and reasonings in regard to them. If it be conceded that it is adequate to the demands of the finite universe of matter and spirit in that it can mirror its facts and relations by those processes of responsive intelligence which its physiological theories provide, it fails altogether to explain the presence of our ideas of space, time, and God, and their relations to finite beings. That these conceptions are often present to the minds of men cannot be denied. We do not insist that they believe in them as realities. All that we need to assume is that they can and do think of them. The physiological metaphysics can in some sense explain the presence to the mind of finite objects, and their pictures, and their generalized notions, and, after its fashion, of their relations; but it cannot possibly conjure into being any nervous responses, any combinations or reflex actions which shall explain the notion of time or space as unbounded, or of God as self-existent and everywhere knowing and acting. Indeed, unless we greatly misunderstand Mr. Spencer's avowals, he limits the power of human ideation to the capacity to picture a certain extent of finite material, which must break down under its impotent efforts to grasp more than a limited quantum of combined and expanded objects and their relations. He very naturally attempts to dispose of space and time and the infinite by sending them to the limbo of *pseudo-ideas*, but he does not send them so far from the border-line of those thoughts and ideas which bask in the clear sunlight, that they do not now and then obtrude their dusky shadows along the horizon that bounds our everyday human thinking. He rightly judges that he has no place for these ideas in his system, for if all thinking is but the charging and discharging of so much nervous force, or the *dis*-location and *re*-location of so many brain-cells, then it is evident that there is no apparatus which can picture to man any but finite objects. The physiological

metaphysics furnishes no such apparatus, for by its own showing the highest capacity into which the intellect of man can be developed can never rise beyond the actions and reactions of a definite quantum of nervous matter, as it is acted on by a definite quantum of existing stimuli. How can such a mind know space, or time, or God? How can it even think of them? Or how, with the materials which are furnished for it to work upon, can it construct for itself the conceptions of such entities? We are well aware that Spencer, with a *naïveté* that is charming, often breaks from the logical chain which should bind him to his system, and flies and even soars above it, in speculations concerning the mysterious unknown that is symbolized to men by its perpetual approximations to reality, which are doomed ever to change because they must ever fail to do justice to the unreachable and inexpressible truth. We know very well that he represents it as the crowning glory of his system of development, that it satisfies man's belief that there is an unknowable object of longing and worship, and that his conceptions of its nature must be for ever changing because inadequate. But we cannot see how, upon his own theory, he finds any place even for the conceptions of what he says cannot be known, for the reason that he makes the very conception impossible. It would seem to us that in order to know that we cannot know it, we must know what the something is which we cannot know, and for the power to conceive such an entity his theory literally and figuratively provides no place in the human brain. It is doubtless grateful to him now and then to break from the limits of his own principles to contemplate some of the many things in heaven and earth which are *not* dreamed of in his philosophy; but he should never be permitted to stray beyond the inclosure within which he has confined himself lest he impale himself upon some of the stakes with which he has hedged himself about. A philosophy which cannot even think of time, or space, or God, has already doomed itself to self-destruction, however ambitious it may be to settle questions which it has demonstrated its incompetency to entertain.

But we ought to bring our meditation to a close. No phenomenon of modern thinking is more marvellous than the suddenness with which the physiological metaphysics took form and attracted to itself public attention. It is far more wonderful that it should have been accepted with so little scrutiny, and been assented to with so blind and headlong an allegiance by large classes of men who claim to be little more than laymen in both physiology and philosophy. It is more

wonderful still that the attempt to challenge its assumptions and to scrutinize its evidence, especially by philosophers or theologians, should have been resented as bigoted and ignorant intrusions into the domains of pure science, and have fixed the devotees in a more blind and unquestioning faith in the extremest conclusions, or have even determined the sympathy of some towards the most reckless assertions of principles that are grossly inconsistent with religion, morality, and social order.

The doctrine of development in the sphere of life, whether vegetable or animal, is familiar to the experiences of the most superficial student of natural history. The distinct assertion of it in a wider reach and application, after a fixed order or plan, when propounded by modern naturalists, had a highly poetic and even a religious tinge, such as at first made it suspicious in the judgment of sober analysts. Only devout Theists, or mystic Pantheists, or imaginative naturalists, would favourably regard the theory of germs as containing within themselves the promise and potency of so wondrous a life which was waiting to be developed from within, and which, in its turn held within itself the capacity to produce germs of still greater promise and potency. The extension of development to the production of new species required only a larger faith and a more extensive observation. It was not till the tendency to variation was conceived of as in some sort a mechanical force, and capable of approximative mathematical formulization, of course without warrant, that the theory gained a hearing from the schools. The emphasizing of the influence of environment as coacting rigidly and severely with the tendency to variation, and the addition of the struggle for existence and the survival of the fittest, tended to abate still more of the poetical and religious aspects of simple development. Even then there was no necessary inconsistency with the belief that intelligence originated and controls the operations of life in the individual and the species. Indeed, the theory, rightly viewed, if you take intelligence and spirit out from its domain, supposes a plan and prevision with the amplest resources for combination and selection, and is not inconsistent with the devoutest Theism. The very word development in the minds of most men, and as the unconscious speech of even atheists and naturalists, supposes a plan after which phenomena are evolved to view. Unluckily when the theory and relations were extended across the boundaries of simple life, it was taken up by men who believed that life is only a more complex form of mechanism, and spirit a more complex form of life, who held, moreover, that mechanism rules the universe, and that

all its wondrous phenomena, from attraction to thinking and loving, depend simply on the collocations and motions of particles, that are by themselves inert, and, compared with one another, are indistinguishable. As soon as this construction was accepted, the poetico-religious theory of development became only a stupid game of permutation and combination. The progress of the universe was as uninteresting and as uninformative as the evolution of logarithmic indices that are never applied, and, what is worst of all, the system which derived all its plausibility and interest from the phenomena of life provided for its own refutation and abandonment by the suicide to which it was self-doomed. It teaches that the ultimate molecules or simplest forms of matter have not only the capacity for, but they are self-moved to, acts of combining into more complex unions, each of which is capable of phenomena higher in the scale of existence. When the highest forms of the inorganic pass, by insensible gradations, into the lowest forms of life, the higher forms of life begin to put on the lower forms of sentience and intelligence. It follows by strict necessity that all the spirit of which we are cognizant—all finite spirit, is but some highly developed form of matter. It would seem that a universe like this, with germs like these, endowed with such varied capacities of coaction and development, and certain to proceed with advancing steps through an ascending line of higher possibilities, must require as its supplement and explanation a plan—a thought implying a thinker. We have seen that the logic of the system must exclude even the thought, and makes no provision for the belief of such an agent. The contempt and scorn, however, with which this belief has been rejected by so many evolutionists can only be pardoned in view of the profound ignorance that teleological views have been held by some of the profoundest philosophers who have made the most valuable contributions to positive knowledge. It would seem also that, in proportion to the earnestness with which fact and experiment have been insisted on as the only verifications of hypothesis, and the more distinctly mathematical determinations of law have been exacted, the more romantic and gratuitous has been the faith in forces wholly incapable of mathematical promulgation, to which experiments even of the most general character could not possibly be applied. As we follow out the system into other applications, we find that the theories of ethics and politics derived from it are as offensive as the materialism and atheism which it involves or supposes. Perhaps we may say that they are more immediately dangerous and offensive because they are capable of being more directly destructive in their consequences. And yet so generally has

literature accepted this physiological philosophy as alone rational and certain that it is assumed by those who know little of physiology that this science of life, as misunderstood and misapplied, is the foundation for and introduction to ethical and political philosophy. That the science of man in his actual nature and in all his capacities is the proper introduction to ethics and politics is true, but this is quite another thing than that the sense of duty and the recognition of right are the products of social interactions, and are resolved into the conceptions of interest which have been developed by a brutal struggle for supremacy, and wrought into the brain by the manifold repetitions of force, prompted by the selfish and sensual desires which were the only impulses by which man was originally moved.

We must own that it is somewhat surprising that any protest against such a system which is founded on its practical tendencies should be resented so sensitively by a certain and a large class of critics as necessarily proceeding from theological traditions or prejudices.

We are more surprised that the learned presidents of academies of science are sometimes more anxious to avow their adhesion to the doctrine of evolution than to state in which of its many senses they understand and accept it. Or is it possible that they do not understand that there is a theory of development which not only consists with the belief in thought and a plan in the history of the universe, but requires for its beginnings an intelligent and interpreting spirit in man as truly as it does an originating and sustaining spirit in God? Is it possible that they can be so ignorant as not to know that evolution does not necessarily mean a blind force acting by mathematical laws, which of themselves are the products of highly sublimated star-dust, according to a law of progression which is itself prescribed and assented to by other phenomena somewhat more persistent than the rest, and whose attenuated skeleton of materialism is made to seem plethoric and buoyant by fine feathers like heredity, development, differentiation, and integration, some of which are not yet legitimized by definition or verification, and others of which are confessedly borrowed from a philosophy that is as mathematical and analytic on the one hand as it is poetic and devout on the other? We would also express our surprise that these leaders of scientific opinion who happen to have the reputation of believing in such spiritual agencies in the universe as man and God, should deem it necessary so carefully on scientific occasions to affirm that science concerns itself only with the laws of nature and the phenomena which

these laws explain, and never care to inquire whether spirit is not as truly an agent in nature as matter, and whether, both as created and creator, it may not determine phenomena without violating law and order in the universe. We know that theologians and metaphysicians are foolishly sensitive and intermeddling, and that they are alarmed by uncommon phrases, but we see no reason why, because a man is a scientist, he should have so many negative protests for theistic theologians, and so few for atheistic materialists, who in their way are equally blind and romantic in their fondness for high-sounding phraseology.

But what surprises us most of all, is that the logic of the system itself has not oftener been scrutinized and more decidedly rejected by scientists. Surely there is a difference between vague and distant affinities and significant likenesses, between analogies that compel and so-called analogies that exclude conviction. It would seem that science ought to be as sensitive to unlikeness in phenomena as to likeness, and more than all should be foremost to declare that a metaphysics which destroys itself by its own logic, and every science which it ought to sustain and account for, ought by common consent to be relegated at once to the limbo of the many speculations which have died by their own hands.

P.S.—The preceding meditation, if it has served no other purpose, may have made conspicuous the difficulty of treating in a popular manner a subject, the fundamental conceptions of which are liable to vagueness of use and diversity of interpretation. In view of this liability, the writer subjoins a brief sketch of the history of the terms evolution and development in modern science, which, since writing the above, he finds in R. Euckens' *Geschichte und Kritik der Grundbegriffe der Gegenwart*, Leipzig, 1878.

Explicatio first appears interchangeably with *evolutio* in Nicolas of Cusa, but used in a real and not simply a logical application. Kepler applies it to the production of thoughts as well as things. Development—Germ., *Entwickelung*, in the modern application or proximately—is used occasionally by Kant in his early writings. Through Herder, with whom it took the modern definite meaning, and was a favourite word, and Tetius, it was adopted into general use, and has now become almost trite. The term development, strictly construed, did not at first correspond to the modern acceptation. Originally it supposed an outfit of properties and powers, which are unfolded in process of time. The modern use supposes the fitting out or providing the subject with

powers to be itself the product of development, carrying us back to certain fundamental powers from which these secondary capacities proceed.

This genetic interpretation was well known to the Greeks, pre-eminently to Aristotle, who, following Plato, makes the whole to precede the parts, the type determining by its presence and agency their formation and working. This view remained current through later antiquity, the early Christian times, and the middle ages, with here and there an exception. It was not, however, till modern philosophy taught us to comprehend being by means of causation that the genetic method of defining and explaining phenomena was introduced. This explained how analysis into elements, conceived as living powers, gives at once the historical progress and the philosophical explanation of events. But the first in time is not necessarily the simplest and the ultimate, and development by tracing the historical order is still obliged to ask what is developed, and how and to what—that is, it must go back to causes and their results.

Nor may we overlook the fact that the genetic method may be applied in every one of the significations which development both as term and conception has assumed in modern philosophy. These are many. On the one side, the universe is made to come from a single ground-force; on the other, several are assumed as necessary. One holds to matter as the beginning, another to spirit; one proceeds from unity to multiplicity, another from the simple to the complex; one makes it a formation from within outwards, another a superposition from without. The one class of tendencies begins with Nicolas of Cusa and culminates with Hegel, who develops all forms of being by the movement of the concept; the other begins, as it were, with Descartes and ends with Darwin, which last theory has in some circles almost appropriated the conception of the word development in his own special interpretation. The term without qualification should be avoided as involving confusion and vagueness of thought. Or if we give to it a definite meaning, we must interpret it in the sense of some special theory.

The Darwinian theory knows nothing of inward dispositions or tendencies. Its strength lies in the definiteness with which it states its elements or forces, and its entire rejection of all inner agencies, but its weakness lies in the obligation which it assumes to explain phenomena in causal as well as in historical relations. To do this successfully it must give the laws of the workings of its cause, and as it only knows mechanical laws it often is unable to do this. The next difficulty is to account

for the permanence of these effects in sustained forms of being, under the coaction of so many counteracting and co-acting causal agencies. To fall back on simple heredity is to fasten to nothing, and to fail to see that this includes all these difficulties within itself. To fail to regard permanent forms as effects to be accounted for is to give up the most important problem of all, and to be content with elements only, and to abandon that with which development has to do by the wonderful complication of the universe as it is at present. All these difficulties gather strength, the wider and more varied is the field which is covered, especially when as now this method is applied to the sphere of spirit. Doubtless it has thrown some light upon some of its phenomena, but to spiritual phenomena it is most misleading when it assumes to judge wholly by material analogies. Especially would it be to assume that all which the spirit has or does comes to it from without. Great ingenuity has been expended in the attempt to show how this is possible—e.g., how customary combinations can be fixed as permanent laws, how the instinct of self-preservation has been transformed into a moral law. Against all these ingenious explanations we should ask whether the method itself were not inconceivable and self-destructive? What conception can we have of a soul with no powers of its own? Can there be an effect without a counter-working? We can escape these difficulties only by simple materialism; but this brings difficulties of its own. If we believe in spirit we cannot escape original tendencies. If we resort to custom we must assume an original capacity for habit as a causal force acting under law. Similarly with judgments of worth. We gain nothing by resorting to the unconscious except to solve a problem by getting rid of it. We gain nothing by analyzing phenomena into minute elements; for the question returns, How are the ultimate elements endowed, and what can they effect? If we deny original activity working according to law to the spiritual life, we must deny all permanent truths, and with it the causal force of the genetic method itself. With these denials goes the denial of science itself. It were ridiculous to concern ourselves with the problems of reason, after reason were banished from the world. The whole force of modern thought has arrayed itself against this materialistic sophistry—prominently, Kant and Goethe: Kant has opposed to false analysis the true by showing that an original spiritual activity must be assumed, to render it possible to hold anything to be simple and ultimate; Goethe in a memorable passage in his correspondence with Schiller, against that class of Frenchmen who think a whole is explained by the division of

its analyzed parts. It follows from all this, that the doctrine of development is full of blessing or of bane, according to the presence or absence of other fundamental conceptions and relations.

A vote of thanks having been accorded to the author, and to the reader of the paper, a discussion of a general character ensued, in which the Rev. Prebendary Row, the Rev. R. W. Ground, the Rev. C. L. Engstrom, the Rev. T. M. Gorman, Mr. Habershon, and the Chairman took part.

The Meeting was then adjourned.

ORDINARY MEETING, JANUARY 5, 1880.

**THE REV. ROBINSON THORNTON, D.D., VICE-PRESIDENT,
IN THE CHAIR.**

The minutes of the last meeting were read and confirmed, and the following elections were announced :—

MEMBERS :—The Right Rev. Bishop Callaway, D.D., M.D., Kaffraria ; Rev. C. S. Rivington, M.A., India ; J. A. Rossiter, Esq., Ceylon ; M. H. Sutton, Esq., Reading ; Rev. H. Taylor, M.A., Humshaugh ; Rev. H. G. Watkins, Barnet.

ASSOCIATES :—M. Bulteel, Esq., M.R.C.S.E., London ; Captain J. B. Carey, Malta ; Rev. R. Daniel, B.D., York ; G. Heap, Esq., London ; Rev. J. R. Lewin, India ; J. R. Mosse, Esq., M.I.C.E., Ceylon ; Rev. W. H. Painter, Bristol ; Rev. J. Priestley (Life), India ; Mrs. Huish, Isle of Wight.

Also the presentation of the following books for the library :—

"Proceedings of the Royal Society."	<i>From the same.</i>
"Climatic Changes." G. Heap, Esq.	<i>Ditto.</i>
"Ecce Christianus." By Anon.	<i>Ditto.</i>
"The Christian in the World." By M. H. Sutton, Esq.	<i>Ditto.</i>
"Convict Life."	<i>Messrs. Wyman.</i>

The following paper was then read by the Author :—

THE DRUIDS AND THEIR RELIGION.

By JOHN ELIOT HOWARD, F.R.S.

Introduction.

MY introduction must be in the way of apology. I have undertaken to write upon a subject historically obscure, and regarding which we must be content to accept the best amount of evidence we can procure. The time will not admit of full treatment of the subject : I, nevertheless, hope to be able to communicate some portion of the interest which the inquiry into the history and antiquities of our own land presents. I have been met at the outset by formidable difficulties, not a little increased by passion and prejudice arrayed on both sides in the multitudinous controversies that have arisen, but shall

endeavour to steer between Scylla and Charybdis, and to conciliate some who at present are averse to the study. Circumstances have through the last twenty years led me to pay frequent visits to "wild Wales;" and I must acknowledge an interest in the people as well as in the scenery which may scarcely seem belonging to one whose life has been passed in the vicinity of the Imperial city; whose daily journalists teach us to look down upon the rest of England as "provinces;" "provincial towns,"—"conquered," I suppose, by the Roman legionaries stationed in London when Boadicea and her valiant "British" rose against the central authority. I must also confess that I am attracted by the peculiarities of a rich, fluent and ancient tongue, and one which seems, to my surprise, to have some deeply philosophical principles involved in its original structure.* Why should we desire its extinction, or shut our eyes to the very obvious truth that *we* are not a homogeneous nation?—not Romans, not Anglo-Saxons, not Britons, except in part; least of all can we trace our descent from the lost tribes of Israel, being, without knowing it, of the Circumcision. In consequence of this latter descent it is said *we* are to inherit all nations.† If any do not exactly see this, it is so much the worse for them, for "when God has desired to place a portion of the heathen heritage in our hands, He has made us seize it by violence(!), thus breaking the heathen kings and potentates into pieces like a potter's vessel." It is not my object to controvert these wise people, who find in the national inclination to drunkenness one of the strongest arguments for their being "the Israel of God;" but it is quite to the point on which I am writing to show the amount of ignorance that prevails, even among "Anglo-Saxons." It appears on the same authority that the Irish, or at least the southern portion of the nation, are "cursed Canaanites," and therefore their lives and liberties, to say nothing of their lands, are at the disposal of the Protestants of the North, who are God's Israel, and if they find the land too narrow for them have only to march southward and possess their inheritance!

In an interesting account of a Board school for deaf mutes which I recently read, it is recorded that the astonishment of the pupils had no bounds when they found that the world extended far beyond London. The ignorance of these afflicted ones simply calls forth our sympathy; but the ignorance of

* See *Gomer*. By Archdeacon Williams, 1854.

† *Anglo-Israelism Examined*. By F. H. White; 1879.

would-be instructors of the people who can assert that the smoke hanging over our land and the reflection from the lights by night, are to bring to mind the pillar of fire by night and of cloud by day—deserves a measure of reprobation which it is foreign to my purpose to bestow.

One of the arguments brought forward to prove our identification with the ten tribes I will dwell upon a little, since it furnishes a suitable introduction to my remarks on the antiquities of Britain. It is this, that "We possess Jacob's stone. This stone the author of forty-seven identifications calls the Signet-ring of the Almighty, and says it was the chief cornerstone of the Temple, and was secured by Jeremiah and taken by him to Ireland, and finally placed in Westminster Abbey and deposited under the seat of the Coronation Chair."

This stone is indeed a very remarkable one. We are assured by Jewish tradition that it consists of several stones, which, being emulous of the honour, rolled themselves into one; in proof of which the account in Genesis is referred to, that Jacob "took of the *stones* (plural) of that place and put them for his pillows;" and again, Jacob took "*the stone* (singular) that he had put for his pillows, and set it up for a pillar, and poured oil upon it."

Being thus a miraculous stone from the beginning, no wonder that it was an oracle. It was brought into Ireland by Simon Brech, the first king of the Scots, 70 years B.C.* 370 years afterwards it was transferred into Scotland by King Fergus, and in the year 850 was removed by King Kenneth (who subdued the Picts) to the Abbey of Scone, and destined for the coronation of kings. At length Edward I. of England, the conqueror of the Scots, having led into captivity John Baliol, their king, possessed himself of this stone, and placed it as an offering to the Almighty in the year 1297. Much more may be found about this stone in Keysler and also in Fergusson.†

But the unfortunate thing for our theorists is, that this stone does not promise rule to the Anglo-Saxons, but to the Scotti, or native Irish,‡ the "Canaanites" of the same writers: according to the oracular declaration:

"Ni fallit fatum, Scotti quounque locatum
Invenient lapidem, regnare tenentur ibidem."§

The stone no longer either groans or rejoices according to the character of the occupant of the throne, but it may be

* Keysler, p. 25.

+ *Rude Stone Monuments*, pp. 382, 439.

† See Smith's *Dictionary of Greek and Roman Geography*.

§ Keysler, p. 26.

supposed to proclaim this lesson, that the monarchy reposes more safely on the *affections of an united people*, than upon the serried array of the bayonets of Imperial power. The idea of the extraordinary destiny of "the Anglo-Saxon race" finds its way into unexpected quarters, as in the following extract :

"There is at the bottom" (of the May Meetings) "a real desire to do good to others, with the added notion that the *Anglo-Saxon race is the proper vehicle of good to everybody.*"—*The Times*, May 20th, 1879.

I hope, therefore, it will not be thought that I am treating of "things remote, impossible, and false," but rather of "that which before us lies in daily life," when I endeavour to show that to review our "dim original and prime" is essentially necessary. It is surely disgraceful not to know what pertains to our own country.

Camden, in his *Britannia*, has well shown how many of the names of our towns, our rivers, and our local sites are Welsh, so that we cannot comprehend the names of these without its help, nor understand the meaning of our rivers, so graphically named as they were by the original dwellers on their banks. The Wharf, for instance, of which Camden says, "If any one would derive the name of it from the British word *guer*, swift, the nature of the river will favour him." The Dee, of course, is the *black* river, whilst on the other hand Pont-aber-glas-llyn, in few words, describes a bridge and the river flowing under it, proceeding from a lake coloured blue-green by copper ore. This lake is in the hollow of Snowdon.* We cannot name a basket without being reminded that the word (*basged*) is purely British, as well as that of the *withy* (*gwydd*), from which it may be constructed. We cannot spread the festal board aright unless the *board* is the Welsh *bwrdd*, that is, a table. The door (*dor*) of our house is British, and when we go forth through it, it is to be understood that we go on our way (*ffordd*). The implements of the husbandman's toil, such as the coulter (*cwlltyr*) of his plough, may often speak Welsh. A *cord*, at any rate, is explained as something twisted (*cord*, from *cordeddu*, to twist); and even in the prince's motto, *Ich*

* The word *glas* is originally derived from woad (Herbert, p. lvi.).

"Ilinent certè aliis (herbis) aliae faciem in populis barbarorum feminæ, maresque etiam apud Dacos et Sarmatas corpora sua inscribunt. Simile plantigini *glastum* in Galliâ vocatur, quo Britannorum conjuges nurusque toto corpore oblitæ, quibusdam in sacris et nudæ incedunt, *Aethiopum* colorem imitantes."—Pliny, lib. xxii. 11. i.

dien (*senseless* in German to my mind), we surely find the very words, *Eich dyn*, "Your man," pronounced when the new-born British-Welsh prince was held forth to the admiring crowd from the window of Caernarvon Castle. We may even go higher in the social scale for illustration, for what is the very name of the queen we have referred to? Boadicea is the *British Victoria*, goddess of victory! *

For good or for evil, the interests of the Welsh and English (and let me say Irish) are inseparably entwined together; and it surely ought to be the mission of the ministers of peace and goodwill amongst men to remove what remains of the feelings excited in the hearts of peoples once oppressed, but now enjoying equal privileges with their conquerors. I view with no favour the attempts to eradicate the Welsh, the Irish, or the Gaelic languages, and to supersede them by the instruction of our Board schools in *English*. One language without a competitor is apt to degenerate, as we find in London. In conclusion I may be permitted to express regret for the loss of the assistance of Welsh friends (amongst others our *confrère*, Canon Lysons) whose memory I cherish, and who would have helped my imperfect Welsh.

Antiquities of Britain.

I am confronted at the very outset of my inquiry by this difficulty: Can it be proved that the megalithic monuments, the cairns and dolmens, which still arrest the mind with an undefined impression of immeasurable antiquity, have any relation to the present population? or may they not rather be the survivals of an extinct faith belonging to an aboriginal people long since passed away? Can they be proved to have any relation to the Druids and their religion? So much light has been thrown on this subject by the researches of a living author,† that it is only requisite that I should advert to some points on which I venture to dissent from his views.

Mr. Fergusson says, "the impression on his mind is every day growing stronger that the dolmen builders in France are the lineal descendants of the cave men, whose remains have recently been detected in such quantities on the banks of the Dordogne and other rivers in the south of France. These people seem neither to have been Celts nor Gauls, but the people of Acquitaine, and allied to the Cimbrians, and there-

* See Williams's *Welsh Dictionary*, *sub voce*, "Buddigion."

† Fergusson's *Ancient Stone Monuments*, p. 32.

fore, probably, to the Welsh. The trade in tin from Cornwall across France to Marseilles seems to have followed a track coinciding with the line of these dolmen-building, *ac*-speaking tribes (331–333). We have, therefore, at once a suspicion of great antiquity. On the other hand, Mr. Fergusson proves that megalithic monuments continued to be erected till a comparatively recent date. Indeed, the custom of erecting these is still extant amongst a hill tribe in India.*

We cannot, then, certainly determine the age of such a monument as Stonehenge from its megalithic character. We must find, if possible, some other sources of information. Now tradition, if it can be at all relied upon, assigns a greater antiquity to the inner circle of "blue stones" than to the more striking surrounding circle of trilithons composed of sarsen stones found in the neighbourhood. The eleven "blue" stones are of a different nature, "being all cut from igneous rocks, such as are not to be found nearer than Cornwall or even Ireland." It is, then, not at all improbable that these may be of an older date, and brought, on account of their supposed sanctity, from Ireland, as tradition records. None of these are large—one of the finest only 7 feet 6 inches high; but it is quite consistent with what we learn elsewhere, that the peculiar sacredness of the place may have attached to these, and that the more majestic *trilithons* may have been erected afterwards as a memory of the British chiefs slain there by Hengist.

Nennius records that, "at a feast held at the palace or monastery at Amesbury, to which it was agreed that all should come unarmed, three hundred British nobles were treacherously slain by the followers of Hengist, who had concealed their weapons under their cloaks." But why was the feast appointed at this out-of-the-way place, except that on account of its sacredness it was the national gathering-place of the Britons?

This, indeed, is what we gather from the British bards. It is called the great circle or sanctuary of the dominion, by Cuhelyn in a verse to the praise of Eidiol, who was *presiding in the circle*, a man eminently distinguished for wisdom.

"A proclamation was issued inviting equal numbers to a conference at a banquet of mead. The mead and wine are distributed by the knights of the enclosure at the appointed spot, and the spot appointed was the precinct of Iâr, in the fair quadrangular area of the Great Sanctuary of the Dominion."†

* See *The Early Dawn of Civilization*, p. 23.

† Edwards's *Mythology and Sites of the Druids*, p. 313.

Cuhelyn was a bard of the sixth century, according to Davies (of the eighth or ninth by other authorities), and of course the language is difficult to translate; but in connection with what is said elsewhere, I think we may safely conclude that the *Mawr Cŵr Kyvoeth* was the circle of Stonehenge.

From Aneurin we learn that the feast was celebrated in a suite of temporary buildings upon the Ystre or Cursus, into which one of the avenues leads from the Great Temple. This is half a mile north from Stonehenge, about two miles long, inclosed by two ditches 350 feet asunder. This, then, might be the "palace" of Nennius. The temple was apparently none other than the adjacent Stonehenge, sacred to the Supreme Being (according to Davies)*; but the character and worship of the priests who inhabited the "monastery" show pretty distinctly that the whole was a survival of heathenism, whatever slight varnish of Christianity might be spread over the narrative by later authorities. The writer of the "Pictorial History of England" seems inclined to agree with the learned Herbert, that Hengist and his associates were the parties plotted against. I must confess that this is the only solution which can be found (in my opinion) for the mysterious language of the bards. Vortigern is blamed as being "Gwrtheyrn Gwrthenau," or "Vortigern of the untoward mouth."† The 58rd triad tells us that "He revealed the hidden dragons which Lludd ap Beli had concealed in the *stronghold of the higher powers*,—out of love for Rhon-wen, the daughter of Hengist the Saxon." This was one of three disclosures which were sufficiently important to cause the downfall of the cause of the Britons. "Some secret of vast moment was divulged by him out of friendship to his allies and love for his wife," the beautiful Rowena.

A poem of Taliesin (p. 63) is said to be extant concerning this "plot of long knives," *Twyll y cyllyl hirion*, as it was called by the Britons, which, if published, might still further elucidate the subject; but in the meantime we may partly guess that there was, in all probability, some ulterior design in inviting a comparative handful of Saxons to a feast at which the British nobility from all parts of the kingdom, and even from Ireland, assembled. They were to come unarmed, as being the guests of Vortigern. The flowing mead was abundantly supplied, in cups of glass, to the illustrious assemblage of gold-adorned guests—the torquated Britons

* But to Hên Velen, Belinus the Ancient or the Sun, according to Welsh authorities.—Herbert's *Brit.*, p. 49.

† *Britain and the Romans*, p. 64.

and the Saxons with their ornaments of amber,—and it is easy to understand that, according to preconcerted arrangements the Britons might have withdrawn; and the Saxons, overcome with wine, might have easily been consumed in the palace by fire, or otherwise disposed of by the hidden “dragons of Beli.” Eidiol, who was “president of the circle, and knight of the course,” showed himself quite competent to the task. He is celebrated as “the strenuous one,” and is said to have slain, or perhaps butchered, 300 Saxons with a staff of service wood.* The Saxon chief, however, anticipated this plot (if plot there were) by giving the appointed signal, *Nimd eure seaxes*, and the flower of the British nobility, 360 in number, were cut off, three only escaping. Vortigern, it is to be observed, was not involved in the strife, which soon extended over the whole kingdom. As regards the connection of all this with our subject, it is to be noted that the feast was that celebrated on the *Oyntevin* or *1st of May*. A shriek was heard on the night of every May-day, over every hearth in Britain, which was thus interpreted by a great proficient in occult knowledge: “the shrieks arise from a contest between the dragon of Britain and the dragon of a foreign nation, which on the night of May-day endeavours to conquer her, and the shriek you hear is given by your dragon in her rage and distress” (p. 66). This was continued during the supremacy of the bards of Beli, the British Apollo; and, however apocryphal, the story alludes to this fearful tragedy befalling them at the Bel-teinne, or feast of (we cannot doubt) *this same deity*.† If the Saxons were entirely pagan, so we may well believe were their opponents also, in the depths of their hearts, if not in outward profession. Now Vortigern is allowed to have been a splendid entertainer, and is not accused by his bitterest enemies of being an enemy to his country. Gildas calls him, indeed, *superbus tyrannus*, but exonerates him from blame in the affair of inviting the Saxons, which he says was done with the unanimous voice of all his counsellors. The tragic end of Hengist, when at last he fell into the power of the British, is a strong confirmation of the pagan character of the times. He was made prisoner at Caer Cynan near Doncaster (now Conisborough), was kept for some days, at the end of which Emmrys (Ambrosius) held a council to determine on his fate (p. 75). At this council a bishop (brother to that Eidiol who was superintendent of the Côr Gawr) declared that, whoever might befriend him, he would

* Herbert's *Brit.*, p. 47.

† Smith's *Dict.* “Belinus.”

hew him in pieces as the prophet Samuel slew Agag, king of Amalek. Hereupon Eidiol received a sword from his brother, led Hengist outside of the place, to the summit of a hill, and smote off his head. A mound, still remaining, was erected over his remains. This was probably looked upon as a solemn sacrifice, but whether to the Christian's God or to Belinus (Bel) we are not informed, and may infer as we please.

I think it cannot be denied that Britain in the fifth century was essentially heathen—that the old temples had not lost their sacredness ; and that the bards, genuine descendants of the Druids, though much their inferiors, were engaged for a long period in secret endeavours to cast off even the semblance of Christianity.

It appears to have been at the same era that St. Patrick was engaged in preaching in the sister island. His banishing the snakes probably refers to the success of his mission in putting an end to the power of these “serpents” of Beli.

It were much to be desired that the history of the succeeding age could be written by some one possessed of sufficient *cynvrinach*, or sympathetic knowledge, to comprehend the mysticism of the bards ; and of sufficient theological capacity to be able to unfold the connection which I cannot doubt to have existed between this mysticism and the errors of Pelagius. This remarkable man was a Briton (*Brito*), probably his real name was Morgan, of which word Pelagius might be a translation. His doctrines created a profound sensation. He “asserted the absolute freedom of the will and the perfectibility of human nature by the unaided efforts of man himself.” The foundation on which he rested was not the revelation of some new truth, but the general sentiment of his countrymen, imbued for ages with these very principles. He was crushed* by a decree of Pope Innocentius, issued A.D. 417 ; but perhaps it may be said that his doctrines have never entirely ceased their partial hold on the population of these Isles.

The account given by Jeffery of Monmouth of the erection of Stonehenge bears, in part, the impress of probability, and, if at all correct, would lead to the supposition that Merlin had inherited some of the real science of the old Druids. Merlin, who had been the *prophet* of Vortigern, advised Aurelius to send for the Giant's Dance in Killaraus,† a mountain in

* Smith's *Dict.*, *sub voce*.

† Giraldus Cambrensis says, “In the plains of Kildare,” which is more likely. See *Choir Gaur*.

Ireland. "For there is a structure of stones there which none of this age could raise without a profound knowledge of the mechanical arts."

"These stones," continued Merlin, "are *mystical*, and of a *medicinal virtue*. The giants of old brought them from the *furthest coasts of Africa*, and placed them in Ireland whilst they inhabited the country." Merlin then, having received commission, placed in the proper order the engines which he thought necessary for the work, took down the stones with incredible facility, and afterwards reared them up as a monument to the slaughtered Britons; and, as the British historian concludes, "thereby gave a manifest proof of the prevalence of *art above strength*." It cannot be that the Sarsen stones were removed from Ireland, but the design of the erection might be taken from a like structure at Kildare, which place was celebrated for its connection with Druidic worship, as its name "*Kill dara (the cell of the oak)*" implies. It was there that St. Bridget kept her perennial fire, and a noble round tower, 130 feet high, still exists as a survival of these fire-worshipping times.

In order to examine into the connection between these so-called Druidic remains and the British worship, I consulted Davies in his "*Mythology and Rites of the British Druids*." Without being able to assent to many of his views, I found that in one case the Neo-Bardism of the twelfth century seemed to connect the worship of Ceres and Proserpine with a peculiar caer or sanctuary of this mystical goddess in the Gyvylchi, in the desert of Arvon, in Eryri, or the region of Snowdon.* The annotator upon Camden describes a strong fortress (on the summit of Pen-men-maur) from which an old road, still in part traceable, conducts to the temple. "About a mile from this fortification stands the most remarkable monument in all Snowdon, called *Y Meineu Hirion*, upon the plain mountain within the parish of Dwygyvylchi. It is a circular entrenchment about twenty-six yards in diameter; on the outside whereof are certain rude stone pillars of which about twelve are now standing, some 2 yards and others 5 feet high; and these are again encompassed with a stone wall. It stands upon the plain mountain, as seen when we come to the height, having much even ground about it, and not far from it there are three other large stones, pitched on end in a triangular form."

* E. Davies, p. 299, &c.

This I saw under the guidance of a young Welshman, who enlivened the way in not very successful instruction in his language, especially in the Welsh *Shibboleth*. As usual in these localities, refreshed by the breezy air and beautiful views—for the builders of these circles had a fine appreciation of the best points in the country for extensive views—I examined the Meini Hirion and the stones which lie to the east, which perhaps formed a *kist vaen* for the mystical purification of the worshippers of Ceridwen.



MEINI HIRION, WITH GREAT ORME'S HEAD IN THE DISTANCE.

Whatever glory the sanctuary once had is departed, and it always must have been a very poor affair compared with Stonehenge or Avebury. On my second visit I made a sketch of two of the stones, but could not find any evidence of the number of which it once consisted—probably nineteen, or the metonic cycle. Twelve, our author says, are now standing. Since then the number has apparently diminished. I noticed one which bore the marks of blasting lying near, which a farmer had turned to his own purposes.

All I could discover in that and in a subsequent visit was that it presented a beautiful site for an observatory of the heavenly bodies. I cannot venture into the question between

Davies and Nash (in "Taliesin")* about the meaning of the poem *y Howel ab Owain* to which I have referred. He celebrates, to quote Nash's translation, some "tall and white-necked fair of slowly languid gait," whose company he wishes to enjoy. If Mr. Nash, who is very decided that this was an earthly female, and not a goddess, would but have attempted the task of taking a languid young lady—"Even in bending a rush she would totter, so small, so delicate, so feebly descending"†—from Dwygyfylchi up to the Meini Hirion, he would have been well-convinced by the task that Howel ab Owain had no such intention; but that he either was or professed to be sufficiently "moonstruck" to think of spending the night in observing the "luminary of splendid qualities and fair" which he describes in such romantic terms.

All this Neo-Bardism in the *twelfth* century I conclude to have had no real foundation in the belief of the people. It was otherwise, however, in the earlier ages of mankind, when, as in the days of the prophet Isaiah, the idolaters remained among the graves (or tumuli) and lodged in the monuments (or hidden places), evidently with the object of obtaining some intercourse with the invisible world,‡ a superstition in part described by Sir Walter Scott :—

"Brian an augury hath tried
Of that dread kind which must not be
Unless in dread extremity.
The *Taghairm* called; by which afar
Our sires foresaw the events of war," &c., &c. §

The tale of Arthur is mystically connected with the revival of Druidism; and still this association may be traced in the language of the country. Thus, in Llan Bendy parish, in Carmarthenshire, we find a monument which joins the name of Arthur with another name which can only refer to Ceridwen.||

We are told¶ that the three mighty labours of the Isle of Britain were—

Lifting the Stone of Ketti,
Building the work of Emrys,
Piling up the Mount of Assemblies.

* *Taliesin, or the Bards and Druids of Britain*, 1858.

† Davies, p. 284. ‡ See Ges. Lex.

§ *Lady of the Lake*, canto iv. 4.
|| It is called Bwrdd Arthur and *Gwâl y vilast*. A monument of the same kind distinguished by the latter name exists, according to the author quoted above, in Glamorganshire, and a third *Llech yr Ast* in Cardiganshire. Probably many more, as a similar instance was to be found (of the latter name) near Llandudno. To explain this would be as tedious as unpleasant, as it refers to the transmigrations of Ceridwen.

¶ Davies, p. 402 ("W. Arch." ii., p. 70).

The first of these “labours” refers to what is now called Arthurstone, or Arthur’s Quoit, on Cefn Bryn, near Swansea.

This is described in *Camden’s Britannia*.* It is also called *Maen Ketti*, the stone of Ceridwen. “When complete it must have weighed between 35 and 40 tons.” Motley, in his *Tales of the Cymri*, tells us that, “A species of divination is still practised at Arthurstone, by the neighbouring rustic maidens, who have little idea that they are perpetuating (perverted indeed in its object) the rites of Druidism and the mysteries of Eleusis in their propitiatory offering. At midnight of the full moon, if a maiden deposit in the sacred well beneath a cake of milk, honey, and barley-meal, and then on hands and knees crawl three times round the cromlech, she will see, if ‘fancy free,’ the vision of her future lord; if her affections are engaged, the form of the favoured youth will stand before her, fearfully bound to answer truly her questions as to his sincerity.”

We may suppose all this vain curiosity to be now banished, but in A.D. 1848 it was existing. More extraordinary still are the superstitions extant in Brittany about the remedial virtue of the stones.

Further information on this subject may be found in Smith’s *Dictionary of Geography*, &c., under the head “*Bætylus*.”

Certain incantations brought *more of divinity* into stones, so that they really were worshipped. The Logan† stones were appealed to in judicial cases, to manifest the right by a divine decision. Other stones were supposed to speak and to utter oracular sayings (which notion the Druids no doubt had means of confirming and turning to their own benefit). Keysler, in his celebrated work,‡ instructs us on these subjects, proving from the Acts of different councils the worship paid by our ancestors; thus the “Concilium Nannetensis” decreed:—

“Lapides quoque, quod in ruinosis locis et silvestribus dæmonium ludificationibus decepti venerantur, ubi et vota vovent et deferunt, funditus effodianter atque in tali loco projiciantur ubi nunquam a cultoribus suis inveniri possint.”

I have been informed that certain perforated stones in Brittany are still used for the purpose of two parties covenanting together by joining hands through the stone,§ which is thus called to be a (divine) witness of the transaction,

* Gibson’s *Camden’s Brit.* col. 741. † *Llogi*, to covenant.

‡ *Antiquitates selectæ Septentrionales et Celticae*. Hanover, A.D. 1720.

§ See Ferguson, p. 255.

"velut ibi quoddam numen sit," as the next Council quoted, Concilium Rotomagense, aptly says.

This council was also occupied with the iniquity of *candles* and other gifts brought to the sacred trees and fountains, or to certain *stones*, as if to altars. The Concilium Tolitanum (ann. 681) tells the adorers of idols, the worshippers of stones, those who *light torches* and honour (*excoleentes*) sacred fountains and trees, are admonished that they who thus sacrifice to the devil are the authors of their own death.

In the year A.D. 789 I find the injunction that the *cauculatores* (in German, *gauckler*), enchanters, weather-makers, &c., should mend their ways, and those (*stulti*) who brought candles (*luminaria*) to the stones (*petris*) or fountains should cease this custom (*pessimus usus et Deo execrabilis*). These *cauculatores* might well be remnants and survivals of the old priests.

To come nearer home, we learn in the pages of this erudite author, that in the reign of King Edgar (circ. ann. 967, as is found in a MS. in Christ's College, Cambridge) the strongest admonitions were issued against similar practices, some of which are even unintelligible at the present time. The laws of Canute prohibit the same things, the adoration of the sun, moon, fire-fountains, rocks, &c. All this tends to show us that this natural idolatry had so strong a hold upon the people that the only way found to wean them from it was to introduce them more or less into the bosom of the Church, as the Concilium Nannetensis, for instance, decrees.*

The struggle of the Church with Druidism was, then, long-continued and a very real thing! As in many contests, the victory, though final, was not altogether without compromise.

In the year A.D. 384 the Emperor Theodosius "prohibited sacrifices, and forbade the curious inquisition into futurity by the examination of the viscera" of human beings, practised by the King of Babylon, circ. B.C. 593 (see Ezek. xxi. 21), and by Julian the Apostate (circ. A.D. 363).† To the disgrace of humanity, this absurd and cruel practice lingered thus long. Indeed, we are informed by a French author that human sacrifices were still offered in Brittany in the seventh century.‡

* "Omnibus interdicatur, ut nullus votum faciat aut candelam vel aliquod munus pro salute sua rogaturus alibi deferat, nisi ad Ecclesiam Domino Deo suo," with which agrees "Capitulum," &c. "Ut sacerdotes admoneant viros et mulieres, ut ad basilicas *luminaria* et *incensum*, et bucellas, et primicias afferant," p. 14.

† Smith's *Dict.*, *sub voce*, "Theodosius." See Cwolson's *Seabier* and *Trans. Vict. Ins.*

‡ *Le Morbihan*, par Délandre, p. 21.

In the reign of Theodosius, and by his order, occurred the great destruction of the temples of the gods throughout the empire. A striking illustration of the heathen notion of the actual indwelling of the *numen* in the image occurred during the destruction of the magnificent temple of Serapis at Alexandria. The fall of this great idol shook the popular belief of Egypt to its foundations. The emperor had given orders to destroy the temple of Serapis, but the heathens believed that the deity would resent the slightest affront to his majesty. A soldier, bolder than the rest, encouraged by the archbishop Theophilus, dealt a blow against the cheek of Serapis with a ponderous axe, and the face of the idol fell to the ground. The deity silently submitted to his fate. The idol was broken in pieces, and dragged through the streets of Alexandria.

Cæsar, moved by other considerations, took the axe into his own hands, and struck the first blow on the consecrated trees of the Gaul, saying to his soldiers, “*Credite me fecisse nefas.*” Thus fell the wood of which Lucan gives a graphic description,* every tree sanctified by human blood.

Keysler tells us how long this horrid custom lingered in Germany, and the survival of tree worship even to his own day.

Once admit Pantheism, and you cannot exclude idolatry.

Antiquity of Druidism.

To proceed on tolerably sure ground in the investigation of this subject, we will first glance at the testimony of history. Cæsar† gives the following account of the Continental Druids, derived no doubt in great part from his friend Divitius, Prince of the *Aedui*, who was a Druid, and had a principality in Britain as well as in Gaul. He was an intimate client of Cicero.‡

“They preside over sacred things, have the charge of public and private sacrifices, and explain their religion. To them a great number of youths have recourse, for the sake of acquiring instruction, and they are in great honour among them; for they generally settle all their disputes, both public and private, and if there is any transgression perpetrated, any

* *Pharsalia*, iii., p. 399, &c
‡ Borlase, *Ant.*, p. 81.

† *De Bello Gallico*, lib. vi., cc. 13-18.

murder committed, or any dispute about inheritance, they decide in respect of them. They appoint rewards and penalties, and if any private or public person abides not by their decree, they restrain him from the sacrifices. This is with them the most severe punishment. . . . One presides over all these Druids, who possesses the supreme authority among them. . . .

"The Druids usually abstain from war, nor do they pay taxes together with the others. . . . In particular they wish to inculcate this idea, that souls do not die, but pass after death from one body to another ; and they think that by this means men are very much instigated to the practice of bravery, the fear of death being despised.

"They also dispute largely concerning the stars and their motion, the magnitude of the world and of the earth, the nature of things, the force and power of the immortal gods, and instruct the youth in their principles."

This we may safely rely upon as on the whole a veracious account (B.C. 99-44) of this remarkable system, which, as far as Cæsar could learn, originated in Britain. This accords with the traditions of the Bards, who say that Bardism originated in the Isle of Britain. "No other country ever obtained a proper comprehension of Bardism. Three nations corrupted what they had learned of the Bardism of the Isle of Britain, blending it with heterogeneous principles, by which means they lost it—the Irish, the Cymry of Armorica, and the Germans."*

It was, then, *ab origine*, a purely Welsh institution, but not, as I think, originating in Wales. The resemblance is far too strong to the other great priestly dynasties of Egypt, of Chaldea, and of Persia to allow the tradition of an independent origin to have much weight. We might as well suppose the orgies of Ceridwen independent of those of Demeter in Samothrace.

Strabo, Book iv., tells us that amongst all the Gauls "there are three sorts of persons who enjoy *particular* consideration. They are the *Bards*, the *Vates* (diviners), and the *Druids*. The *Bards* composed and sang hymns ; the *Vates* occupied themselves with sacrifices and the study of nature ; and the *Druids* joined to this study that of ethic philosophy. They have such a great opinion of the justice of the *Druids* that both public and private causes are referred to their decision. Formerly they were even the arbiters of wars, which they succeeded

* *Barddas*, Preface, xxvii.

frequently in averting when they were on the point of breaking out. . . . These last, as well as the others, believed that souls and the world are imperishable, but that there are epochs in which fire and water will predominate. . . .

"The Gauls have, moreover, as well as the most part of the people of the north, strange customs which announce their barbarity and ferocity. Such, for instance, is that of hanging to the necks of their horses, in returning from war, the heads of the enemies which they have killed, and afterwards to fasten them as ornaments before their doors. Posidonius says that he has been a witness in several places of this custom, which at first was revolting, but became familiar by degrees. When amongst these heads there were those of men of distinction, they embalmed them with resin of cedar, and showed them to strangers. They would not part with them for their weight in gold."

"Nevertheless, the Romans have obliged them to renounce this ferocity, as also the customs which belong to sacrifices and divinations wholly contrary to our manners. Such was, for instance, their habit of opening, with one blow of a sabre, the back* of the victim, and drawing predictions from the manner in which he fell. They only made these sacrifices by the ministry of the Druids."

The fourth book of Strabo is known from internal evidence† to have been written in the year A.D. 19. So that we have clear evidence of the state of things at the commencement of our era amongst our neighbours as well as (we must conclude) amongst all the Celtic tribes.

We have thus a tolerably complete account of the Druids from contemporary writers when their order was approaching towards its final extinction under King Lucius in England, A.D. 177, according to Borlase's *Ant.*, p. 149; but not till many centuries later in Mona and in Ireland. The earlier notices are more obscure. Diodorus Siculus quotes from Hecateus the Milesian, who was a great traveller, and accurate in his description of that which fell under his own observation.‡ He wrote about B.C. 500. He describes the Hyperboreans as living in an island in the ocean over against Celtica, not smaller than Sicily.

"Amongst the Hyperboreans were men, priests as it were of Apollo, constantly hymning lyric songs in his praise.§ Also in that island was a

* "The part above the diaphragm."—Diodorus of Sicily.

† Smith's *Dict.*, *sub voce*, "Strabo."

‡ Smith's *Dict.*, *sub voce*, "Hecataeus."

§ *Taliesin*, by D. W. Nash, London, 1858, p. 10.

consecrated precinct of great magnificence, a temple of corresponding beauty, in shape spherical, adorned with numerous dedicated gifts; also a city sacred to the god, the majority of its inhabitants harpers, who, continually harping in the temple, sang lyrical hymns to the god, greatly magnifying his deeds. The Hyperboreans had a peculiar dialect, and were very friendly-disposed to the Hellenes, especially the Athenians and Delians. The moon was not far distant from this island, and clearly showed certain earthly eminences.*

"Every nineteenth year the god descends into this island. *This was the great year of the Hellenes.* When the god makes his periodical visit, he both plays the harp and dances during the night, from the vernal equinox to the rising of the Pleiades, taking great delight in his own successful efforts. A family called Boreadæ, descendants of Boreas, were the kings of this city, and superintendents of the temple, succeeding each other by birthright."

It is scarcely necessary to remark that our author does *not* speak here from personal observation, but in all probability from the reports of Phœnician merchants who had long been accustomed to frequent Cornwall for tin. The mention of a cycle of nineteen years is remarkable, and shows that these Druids were observant of the heavenly bodies. What ground they had for supposing the weather was governed by changes of the moon I do not know. Certainly the summer of 1879 has been a reproduction of the summer of 1860.† The worship of Apollo or the sun is identical with that of the Druids. I think we may fairly deduce the probable inference that in the year B.C. 500 Druidism was in full power in England, and that Avebury, or some similar Druidical temple, had become known to the Phœnician, and subsequently the Grecian traders. Many Greek writers beside Hecateus mention the Hyperboreans.

Beyond this period history will give us no information. All is lost in the mists of antiquity, and our only resource is comparison with other nations.

The records of the Druids have all perished. The most sacred of their traditions, being committed to the memory of their disciples, who were required, it is said, to learn some 20,000 verses, could not survive the cruel persecutions of the Romans; who, in their hatred of the liberty of which these were supposed to be the upholders, crushed both the masters and the disciples.

* Higgins's *Celtic Druids*, p. 118.

† The period of 19 years is the Metonic cycle or 235 months, in which time the lunations return (nearly) and begin as they were before. It takes its name from Meton, the Athenian.

In the Neo-druidism, of which I treat elsewhere, it is probable that we have some faint reflections of the knowledge ascribed to these wise men ; but it is in turning to the philosophy of the East that we derive the strongest assurance of the character as well as the origin of their knowledge. In our Gaelic and Welsh translations of the Bible the Druids are understood to be the representative of the *Magi* (or as we call it), "the wise men of the East," and we must look for that origin of their caste in the *land of caste*, or India in its widest extent.

The Indian philosophy, which leaves nothing undefined, explains this matter also.* There was a time, after the end of preceding worlds, and before the beginning of this, that beings who had acquired merit in the previous state of existence were brought to inhabit this sphere. They could live without food. They could soar through the air at will, and the glory proceeding from their persons was so great that there was no necessity for a sun or moon. No change of seasons was known, nor any difference. There was no diversity of sex, and they all lived in happiness and mutual peace. There was, however, after some ages, a substance produced which attracted the attention of one of the Brahmas, who was induced to taste, and the taste was so delightful that it excited the wish for more, and a principle of evil was now first manifested amongst the beings of the earth, who had hitherto kept themselves pure. The other Brahmas began to follow this example, by which the glory proceeding from their persons was extinguished, and it became necessary that a sun and moon and other shining bodies should be brought into existence.

The history proceeds to explain the origin of the diversity of sex and the difference of colour amongst mankind, and the origin of caste.

The Brahmins, proceeding from the mouth of Brahma, had alone inclination for the divine sciences (*Brahma veda*).

This then, *traditionally*, was the commencement of the *priestly class*, found among the Egyptians, Colchians, Iberians, Medes, Persians, and Etruscans, also in the new world among the Peruvians and Mexicans, and having in common much knowledge which they concealed from the vulgar.

There can be little doubt that the Druids were a branch of this widely-spread freemasonry ; originating with the early

* *Manual of Buddhism*, p. 64.

dawn of civilized society, having close relationship with the *Magi* of the East, and like them great proficients in astronomy, in astrology, and other kindred studies. Pliny says* that in his time the Britons were so excessively devoted to all the mysteries of magic that they might seem to have taught even the Persians themselves that art.

We have probably an indication of this in the survival of the name *Cader Idris*, or the [cadair] seat or chair of Idris. About this Idris we learn but thus much from the Welsh traditions, that he was a great astronomer; but it is otherwise in the East, where he is renowned as the same person as Hermes or the Biblical Enoch, and the Sabians, the old star-worshippers of Harran, looked to his son Sabi as their founder.† In the Coran also the Biblical Enoch is identified with Idris and with Hermes. This Sabian worship came down in full force at Harran till the time of Julian the Apostate, who fell in the Parthian war, A.D. 363.

All that we know of the religion of the Druids seems to present strong affinity with these worshippers of the heavenly bodies, with whom the fathers of the Patriarchs symbolized. See Joshua xxiv. 2, and Smith's *Dict. of the Bible, sub voce* "Haran."

The Tenets of the Druids.

Borlase, in his "Antiquities of Cornwall," examines very closely into the resemblances between the Druids and the Persian Magi. From these I would select some of the most striking, indicative of a common, or at least kindred origin, and throwing a strong, reflected light on Druidism.

First.—The Druids had none but open temples, and these devoid of images; so Cicero tells us that all the Grecian temples met with in the expedition of Xerxes into Greece were burnt at the instigation of the Magi, "because the Grecians were so impious as to enclose those gods within walls who ought to have all things round them open and free—their temple being the universal world."

The Persians, according to Herodotus, "called the whole circle of heaven Jupiter." In this the Druids would have

* *Natural History*, lib. 1, cap. 1.

† Chwolson *Die Seabur*, vol. 1, pp. 246, 787.

seemed to the same writer to have entirely concurred. There can be little doubt that the circular temples of the Druids were erected with reference to the heavenly bodies. I suspect, however, that the reason lay deeper in the system of each nation than Herodotus supposed. The central fire and the circulation of the planets around this may be referred to hereafter. Suffice at present to say, that there is little doubt the Unity of the Godhead* was a fundamental doctrine in both religions—a doctrine reserved as strictly esoteric, and only to be taught to the fully initiated.

Cæsar (Lib. vi. c. xiii.) informs us that the reason why the Druids did not commit their doctrines to writing was as I have stated:—"They appear to me," he says, "to have enacted this law for two reasons, because they *neither wished their doctrines to be made known to the vulgar*, nor their pupils, trusting to the aid of letters, to pay less attention to the cultivation of their memory."

In all this they entirely symbolized with the Pythagoreans, whom I regard as almost one fraternity. The following account of the doctrine of Pythagoras I find in Higgins's *Celtic Druids*, p. 126, quoted from the Rev. Dr. Collyer :—†

"God is neither the object of sense nor subject to passion; but invisible, only intelligible and supremely intelligent. In His body He is like the light, and in His soul He resembles Truth. He is the universal spirit that pervades and diffuseth itself over all nature. All beings receive their life from Him. There is but one only God, who is not, as some are apt to imagine, seated above the world, beyond the orb of the universe; but being Himself all in all, He sees all the beings that fill His immensity—the only principle, the light of heaven, the father of all. He produces everything, He orders and disposes everything. He is the reason, the life, and the motion of all beings."

If such were the opinions held about God, it is very obvious why it was thought necessary to conceal them from the vulgar. Socrates probably lost his life from divulging similar sentiments among the Greeks. Origen informs us that *the Druids were exceedingly addicted to the Pythagorean philosophy.*‡ Pythagoras was born, it is said, at Samos, and was perhaps a Tyrrhenian Pelasgian. It is a curious coincidence that his name might signify, in Welsh,§ one of the main objects of his life, the unfolding of a system of the universe. He is not to

* I use the word "God" and "Godhead," though not strictly accurate, for want of intelligible pantheistic terms.

† Lecture XII., p. 499.

‡ Higgins's *Celtic Druids*, p. 305.

§ *Pyth* (world), *agorad* (opening).

be regarded, however, as a myth, but a real person, though many fables were narrated respecting him. He was born, probably, about the year B.C. 570, and travelled over the greater part of the known world in search of philosophy.*

Ritter believes that through his descent from the Tyrrhenian Pelasgians Pythagoras derived, by tradition, a peculiar and secret *cultus*. Certainly the religious element was the predominant one in his character. His disciples were submitted, like those of the Druids, to severe processes of initiation, in which their powers of maintaining silence were especially tested. Their whole discipline is represented as tending to produce a lofty serenity and self-possession. They had some secret conventional symbols, by which members of the fraternity could recognise each other, even if they had never met before. Pythagoras is said to have been the first to apply to himself the term *φιλόσοφος*, and it is believed that he wished that his disciples should exhibit a reflection of the order and harmony of the universe.† Their pride and exclusiveness, however, and their opposition to the democracy of the day, led to their destruction by fire, together, perhaps, with their master. So, to the discredit of human nature, this grand experiment for its amelioration came to an end. I will proceed to enumerate some further particulars in which the Pythagorean and the Druidical systems agree.

“ Number was the dominant and self-produced bond of the eternal continuance of things.”‡ One is the absolute number and the origin of all numbers, and consequently of all things. This original unity is also called God. Harmony of relation is the regulating principle of the universe. The harmony of the spheres was a pretty and poetical conceit of the Pythagorean mind.

If Pythagoras assigned living reality and power to num-

* “The Egyptians are said to have taught him geometry, the Phoenicians arithmetic, the Chaldeans astronomy, the Magians the formulæ of religion and practical maxims for the conduct of life. The doctrine of the transmigration of souls was derived by him, in all probability, from the East, and Zenophanes mentions the story of his interceding on behalf of a dog that was being beaten, professing to recognise in its cries the voice of a departed friend.”¹ This is quite in accordance with the Bardic doctrine that a wicked man, when he dies, and his soul enters the meanest worm in existence, becomes better, and ascends in the migration of *Abred*.² From this has arisen the saying “*Trample not on thy better*,” addressed to one who tramples on a worm voluntarily and without a cause.

¹ Oic. Tusc. v. 3.

² “Philolaus” in Smith’s *Dict.*

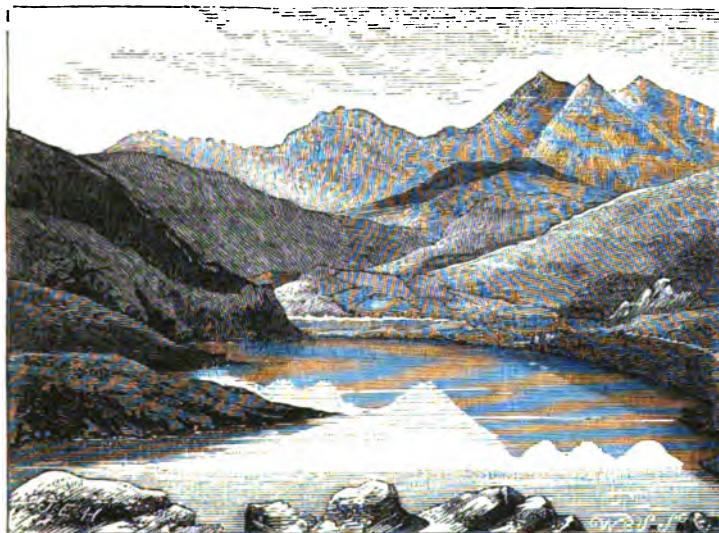
¹ Smith’s *Dict.*

² *Barddas*, p. 244.

bers as efficient in the work of creation, he was not more absurd than we are when we speak of nature and of the laws of nature as if they had any real existence. "The number three was spoken of as defining or limiting the universe and all things, having end, middle, and beginning, and so being the number of the whole."*

Snowdon, as is well known, presents from the eastern side the aspect of three peaks to one mountain, and the highest point is called *Yr Wyddfa*, which seems to imply "*the Presence.*"

"This untranslateable word signifies '*the place of presence,*' or that wherein the Deity makes himself personally manifest, being compounded of *ma* a place and *gwydd* presence. *Gwydd* is also knowledge, and means trees, which is probably the radical sense, and borrowed from the Druids."†



SNOWDON, FROM CAPEL CURIG.

* This, as is well known, is thoroughly Welsh. We have the same notion in the oracles of Zoroaster.

Πάντι γάρ τν κόσμῳ λάμπει τριάς, ἡς μόνας ἀρχει
 Ἀρχή πάσης τμῆσεως η δε η τάξις
 'Εις τρία γάρ νοῦς εἴπε πατρός τίμνεσθαι ἀκαντα,

where the one supreme Father "differentiates" all things, and speaks all into three. St. Augustine tells us¹ that in the Punic *תִּלְוָה*, *three*, signified salvation, salus; perhaps *Gad* (*Jupiter*), good fortune.—*Trans. Bib. Arch.*, iii. 171.

† *Britannia after the Romans* p. 32.

¹ Kenrick's *Phoenicia*, p. 166.

In the Pythagorean system the element fire was the most dignified and important, in this again agreeing with the Druids. The central fire Philolaus terms the hearth of the universe, the house or watch-tower of Zeus (as the Bards thought the sun the abode of Hu, Huan),* the mother of the gods, the altar and bond and measure of nature. It was the enlivening principle of the universe. By this fire they probably understood something purer and more ethereal than the common element. Round this central fire the heavenly bodies performed their circling *dance*.† Farthest off the sphere of the fixed stars; then in order the five planets, the sun, the moon, the earth, and the counter-earth.‡ The revolution of the earth round its axis was taught by the Pythagorean Ephantus and Heracleides; a combined motion round the central fire and round its own axis, by Aristarchus of Samos. The circling dance§ of the Druids was intended to commemorate the above astronomical discoveries; and that these were by no means contemptible we may infer from the certainty that these old "astronomers" could calculate eclipses.||

I refer to Laplace for the history of the early origin of astronomy, and for the connection of Pythagoras with that of the Egyptians, which he supposes to have been founded two Sothic periods before B.C. 139, when this period was renewed, or $1461 + 1461 + 139 = \text{B.C. } 2783$. From other considerations, he places the probable beginning of the Zodiac at B.C. 2500, and I suppose little doubt can be felt as to the astronomical references of the Great Pyramid. It would follow from these, conjoined with those recently observed as to the Chaldean astronomy, that this science had already been cultivated by

* See *Welsh Dict.*, *sub voce* "Huan," also.

† *χορεύειν* is the expression of Philolaus.

‡ *ἀντίκειμα*, the antipodes.

§ "Drud awyrdwth, amnwyth, amniver

Druidion a Beirddion

A vawl nēb dragon." (The bard Cynddelw.)

Translated thus by Davies¹:—"Rapidly moving, in the course of the sky, in circles, in uneven numbers, Druids and bards unite in celebrating their leader," i.e. the Sun.

|| Caius Sulpicius, a Gaul by nation, foretold an eclipse of the moon to the Roman army, upon which Livy adds that thenceforth "Gallos Romanis militibus sapientia prope divinā visus."—LIV., lib. xlii. ch. 37; Borlase, 90.

¹ *Mythology and Rites of the British Druids*, pp. 16, 173.

the joint labours of the wise men of the east for some two thousand years before the age we are considering. It is not, then, too bold a conjecture to suppose that the circles of stones interlacing each other, the central hearth, the triple unity, the eastern position, and so forth, should be embodied in what we call Druidical remains. I have in a former paper alluded to Stonehenge; I have since examined Avebury, which appears to be "the largest and in most respects the most important of the class in this country."* The three immense unhewn stones (one of which is now fallen), which probably commemorated the Druidical trinity, conjoin with a multitude of other particulars in denoting it a temple devoted to the worship we are considering, in the compass of which "half a million of people could stand," or some 250,000 be seated. It is not adapted to the purposes of defence, and it would be as reasonable to suppose Westminster Abbey to have been erected for the purpose of interring the illustrious dead as the circuit of Avebury to have been formed simply as a British cemetery.†

By the Pythagoreans the intervals between the heavenly bodies were supposed to be determined according to the laws of musical harmony, so that their grand organ was the music of the spheres.

Shakespeare seems to have had some notion of this sort of worship, for which he may be excused as having been, as Fergusson says, "brought up, as most Englishmen have been, in the Druidical faith"! He could dispense with pews and cushions.

"How sweet the moonlight sleeps upon this bank !
Here will we sit, and let the sounds of music
Creep in our ears ; soft stillness, and the night,
Become the touches of sweet harmony.

* Fergusson, p. 61.

† Mr. Fergusson says that, "There is certainly no passage in any author, classical or mediæval, which would lead us to suppose that our forefathers were addicted to the worship of a deity so unlikely to be a favourite in such a climate as ours!" I should have been ready to suppose that the very reverse conclusion would be drawn from the visit of the sun being only once in nineteen years. A deity who made himself so scarce would be more likely to be venerated than in climates where his rays were those of the darting Apollo. "The moon walking in brightness," was evidently a more attractive object in Arabia in the times of Job. Our author's argument, derived from the absence of "the groves and oaks these *sectaries*(!) delighted in," must be questionable to anyone who has trod with pleasure among the beautiful trees which adorn the now-picturesque village occupying the site of this temple—for such I venture to call it, although it is certainly too large to be covered in from the weather, which our modern worshipper thinks essential.

Sit, Jessica: look, how the floor of heaven
 Is thick inlaid with patines of bright gold;
 There's not the smallest orb which thou beholdest
 But in his motion like an angel sings,
 Still quiring to the young-eyed cherubims.
 Such harmony is in immortal souls;
 But whilst this muddy vesture of decay
 Doth grossly close it in, we cannot hear it."*

If for "Druidical faith" we substitute the term "natural religion," we shall find many of our noblest minds devoted to it. Byron, who, it is to be feared, profited little by the Scotch sermons of his education, thus speaks of the matter in hand:—

"All heaven and earth are still—tho' not in sleep,
 But breathless, as we grow when feeling most
 And silent, as we stand in thoughts too deep—
 All heaven and earth are still; from the high host
 Of stars, to the lull'd lake and mountain coast.
 All is concentrated in a life intense,
 Where not a beam, nor air, nor life is lost,
 But hath a part of being, and a sense
 Of that which is of all Creator and Defence.

Then stirs the feeling infinite, so felt
 In solitude, when we are *least* alone;
 A truth, which thro' our being then doth melt
 And purifies from self; it is a tone
 The *soul and source of music*, which makes known
 Eternal harmony, and sheds a charm
 Like to the fabled Cytherea's zone,
 Binding all things with beauty;—t'would disarm
 The spectre Death, had he substantial power to harm.

Nor vainly did the early Persian make
 His altar the high places and the peak
 Of earth-o'ergazing mountains, and thus take
 A *fit and unvalled temple*, there to seek
 The Spirit, in whose honour shrines are weak
 Upreared of human hands. Come and compare
 Columns and idol dwellings, Goth or Greek,
 With Nature's realms of worship, earth and air,
 Nor fix on fond abodes to circumscribe thy prayer."†

The inability to understand how worship could be possible on a cold mountain summit, with no protection from draughts, or provision to keep out the rain, is very characteristic of the age.

* *Merchant of Venice*, Act v.
 † *Childe Harold*, canto iii.

All the elements of nature partook of a certain divinity, according to the Magian and the Druidical religion, since all were united to Deity. The universe is "imperishable and unwearied; it subsists for ever: from eternity did it exist, and to eternity does it last, controlled by One akin to it, the mightiest and the highest."

Hence the care to preserve the elements pure became a part of their religion. I must confess that for myself I so far share their prejudices that I should prefer the breezy air of the Wiltshire downs to the atmosphere of Westminster Abbey.

The very corrupting body of the sinner, according to the true doctrines of fire worship, pollutes all creation! The death of the sinner Haman could not take place in the light of the king's presence. Among the true fire worshippers the body was delivered to be torn by dogs and by the fowls of heaven, lest it should corrupt the pure air of heaven.

The soul, as a principle of life, was supposed to partake of the nature of the central fire. Nothing is more certainly recorded in reference to the teaching of the Druids than the practical effect which this had in producing a contempt of death in their scholars.

On these points, however, I may not dwell, for the time would fail me to tell of all the justice and magnanimity ascribed to these kingly priests, who, like Divitiacus, the friend of Caesar, could combine both offices in one, and need not deliver over to the secular arm the offenders, for it was their pleasure to take this into their own hands, and to practise vivisection on a most extensive scale. It was considered good for the prospects of the coming harvest when an unusual number of human sacrifices took place. No doubt they assured the vulgar that the well-propitiated sun-god would then drive away the mists and unveil his smiling face.

It is certain that, like the old Accadians, they considered that nothing but the life of man could atone for man,* and in putting a man to death they only (as the Buddhists say)

* The sacrifice of the firstborn in honour of the sun-god was one of the most notorious rites of ancient Semitic worship. The first month of the year and the first sign of the Zodiac referred to this sacrifice, called *The Sacrifice of Bel*. It is to Accad, and not to Phoenicia, that we must look for the origin of human sacrifice in Western Asia. This inference is verified by two Cuneiform texts in which mention is made of human sacrifice. We have clear indications in these of the sacrifice of children, such as took place in Carthage, in Phoenicia, and in Palestine,—also in the British Isles.—See *Trans. Bib. Arch.*, iv., p. 25.

facilitated his transmigration. It was their mode, their custom, and doubtless these spectacles were as gratifying to the ancient Britons as, to the modern English, the sight of male and female acrobats risking their lives and limbs in their service.

We should bear in mind that the "sermons" connected with the national religion of the ancient Britons were as interesting as modern bull-fights. All could hear the shrieks of the victims, if indeed these were not drowned by the clangour of musical instruments and the howlings of the animals sacrificed.

"An idol named Crom-cruach, consisting of a stone, capped with gold, about which stood twelve other rough stones, was universally worshipped in Ireland before the introduction of Christianity. St. Patrick has the credit of overthrowing this horrible idol, to which the Irish sacrificed the firstborn of every species."*

A plain in Leitrim still retains the appellation of "The Place of Slaughter." The stone which stands most to the east among the *Maeni hirion*, which I have depicted above, is reputed traditionally to have been the place of sacrifice of the babes, and there was connected with it a sort of altar pavement, the remains of which may be seen in the sketch I made.

The Druids had far too keen an appreciation of the popular mind of the day to suppose the masses would be content with scientific lectures. "Things lovely and of good report" would perhaps have been as little able to fill the temple at Avesbury with worshippers as to meet the taste of the millions at the present day. The Druids kept to themselves their science and the best part of their creed. They left to the public their religion, or rather took it into their own hands, for no sacrifice could be offered without their help. By the way in which the blood flowed they read the mind of God, for was not the blood itself in part divine? The channels for the blood to flow in are mentioned by Borlase and other writers, and still shown, if I remember right, in Brittany. This kind of religion seems to have prevailed wherever these so-called Druidical temples were reared, from the land of the Amorites, the Tyrrhene, and perhaps Iberian races, to the far-distant Mexico and Peru—distant in point of space, but perhaps of kindred origin. Mr. Fergusson may, I think, find evidence enough, if he looks for it, that the religion of the Druids was the true national religion, and that no sectarianism disturbed its peaceful course.

* *The Island of Saints*, by the Author (1855), p. 180.

I see no reason to doubt that the Druidical religion and its sanguinary cultus were in full force in England when the ten tribes of Israel were carried captive into Assyria. The co-existence of human sacrifice with a rather high degree of civilization need not be incredible to those who study the great advance of the Mexicans, even in astronomical science. These Aztecs had so far perfected their researches in this direction that they even surpassed their Spanish conquerors in accuracy of computation of the length of the year, and had the method of observing the transit of stars from deep wells, constructed for the purpose, as Mr. Proctor and others suppose to have been the use of passages in the Great Pyramid.

Certain points of coincidence between the doctrines of the Druids and Buddhism are mentioned by Hardy,* and these must have arisen at a date much earlier than any we have been considering. As to Pythagoras, it is clearly a matter of history that he was intimate with Abaris, a celebrated Druid, who came to him from the land of the Hyperboreans. The great resemblance with the Magian religion, which I can only refer to, also seems to indicate a point of connection before the Cymry left their aboriginal quarters.

Unless we are willing to concede a considerable amount of philosophic cultivation to the framers of the language of the primitive Welsh, we shall find ourselves wholly at a loss to account for its structure. In like manner, unless we concede that the structures at Avebury and Stonehenge were *really* temples, we shall be wholly at a loss to conceive what could induce any body of people to rear structures of such vast extent, "the effect of which," as Mr. Fergusson observes (p. 96), "is immensely enhanced by the monolithic simplicity of the whole." No style of architecture can possibly be conceived more suited to the gloomy and austere rites of Pantheism than the circular temples and groves of these nations.

The Welsh derive their migrations apparently from Thrace, and it is there, amongst the old Pelasgi, themselves wanderers from the realms of the East, that we find corresponding rites of worship.

We have positive testimony in Pausanias,† that the mysterious rites of Demeter were performed at Hermione, within circles of stones called *Logades*.‡

Demeter is the same with Ceridwen. Hermione was an ancient city of the *Dryopes*,§ one of the aboriginal tribes of

* *Manual of Buddhism*, pp. 27, 34.
† Gomer, p. 173.

‡ Lib. ii., cap. 54.
§ Query from δρυ·οψ.

Greece, and was the chief seat of the worship of Demeter Chthonia, who appears to have been their principal deity.

The god at Dodona,* was reputed to dwell in an oak-tree, reputed the oldest in Greece, and is said to have revealed his will from the branches. This oak was at first his only temple. All this sounds very Welsh.

At Telmissus (in Lycia ?) there was also a renowned temple, *circular and hypæthral*, where a native god was worshipped with magnificent religious rites.†

"In ancient times," says Herodotus,‡ "the Pelasgi, as I know by information which I got at Dodona, offered sacrifices of all kinds, and prayed to the gods, but had no distinct names or appellations for them, since they had never heard of any. They called them gods ($\theta\epsilon\omega\iota$), *disposers*, because they had disposed and arranged all things in such a beautiful order."

Our research thus tends to connect, if not to identify, the Welsh, by various analogies, with the vanished nation of the Pelasgi, the scattered remains of which were extant in the Classical era in many parts of Greece and Italy. They were called by the Athenians *Pelasgoi*, or Storks, from their habit of migration.§ They were told by an oracle in Italy that they suffered adversity because they had discontinued offering their firstborn, together with the firstfruits of the field. The Pelasgi certainly came from the East.

The Mistletoe on the Oak.

It is necessary to my argument that I should show the relation of the mistletoe to the religion of the Druids. In order to do this I must use the *golden key*, of which I have spoken elsewhere, for this was the *aureus ramus* (the "golden branch" of Virgil),|| than which Pliny (xvi. 95)¶ assures us the *Druids held nothing more sacred*.

In order to understand the mystical secret involved, we must follow with some attention the proceedings of the Druids in gathering this sacred plant.

* Smith's *Dict.*, *sub voce* "Dodona." † Gomer, p. 170.

‡ Herodotus, book ii., sec. 52. § Smith's *Dict.*, *sub voce* "Pelasgi."

|| Virgil, who was born near Mantua, in Cisalpine Gaul, had probably some acquaintance with the tenets of the Druids; at all events, he makes the golden branch, sacred to infernal Juno, the means of gaining access to the infernal regions. (*Aeneid*, lib. vi.)

¶ Nihil habent Druides (ita suos appellant magos) visco et arbore, in quâ gignatur, si modo sit robur, sacratius. Jam per se roborum eligunt lucos, nec ulla sacra sine eâ fronde conficiunt, ut inde appellati quoque interpretatione Græcâ possint Druides videri, &c. Lib. xvi., 95.

A recent French writer describes thus the aspect of Gaul, which to a considerable extent must also have been that of Britain in those days * :—

Instead of a cultivated country, it presented to view only an immense forest with thickets almost impenetrable, from the bosom of which arose, like rounded domes, oaks of secular antiquity.

Nevertheless, in this immense forest there existed vast openings. The dry lands of Champagne, where the chalky soil would not support abundant vegetation, or the sterile districts of Brittany, where cromlechs and stones unhewn by the tool of man † presided over human sacrifices. Here and there were fortified camps whither the population retired with their cattle.

In Britain vast fortifications encircled the summits of the Downs, as we see abundantly from remains still existing.

The area of Stonehenge (or of Avebury ?) was looked upon as a quasi-island in the midst of the expanse of Salisbury Plain. In the north of Gaul the people availed themselves of real islands, and probably of lake dwellings.

In the depth of these sombre forests the Druids had their retreats and their principal sanctuaries. They consecrated them to their divinity, and gave the name of God to that *internal something* (*secretum illud*) of which they were naturally cognizant (qu'ils sentaient par la piété).‡

They were forbidden to cut or to lop these sacred forests. They believed them inaccessible to wild animals, impenetrable to the storm, and safe from the lightning. The earth was believed to tremble, and serpents issuing forth from its recesses to coil themselves round the trees. These forests were arsenals. The spoils of their enemies were here deposited under the care of the ministers of religion. These sacred woods were called virgin forests (*castum nemus*), and they formed sanctuaries, the privileges of which were afterwards attached to the churches.

We see, then, that all was consecrated. They had only to retreat within themselves to be conscious of God, or if their souls "mingled with the universe" of outward things it was to be conscious everywhere of Divinity.

But this gave them no peace. It was a religion of fear, and consistent with the grossest immorality. Nevertheless, there was felt a need of reconciliation with this awful mystery above them. It needs be that heaven and earth should in some way be brought together. There was a pure and serene heaven above them if they could share its blessings.

This meeting-point was found whenever the oak, itself a symbol of Taronowy, the god of thunder, found a celestial visitant in the *aethereal tree* (*Pren aur*), the tree of the high summit (*Uchelvar*).

This tree of pure gold (*Pren pur aur*) could not fix its roots in earth,§ it must be altogether of heavenly original; and so to find a congenial home on earth it rooted itself into that which was already of congenial nature, the dread Taronowy, the mystic oak.

So it was not common mistletoe that would answer the purpose, but it was the *mistletoe upon the oak*, a conjunction even then rare and now almost extinct. It was the great object of the Druids to ascertain when this

* *Le Gui de Chêne et les Druids.* E. Magdaleine, 1877.

† The writer refers to Deut. xxvii, v. 5 and 6. "Thou shalt not lift up any iron tool upon them." ‡ P. Reynaud.

§ Οὐ γαρ αληθεῖη σύτον τινὶ χθονι. Oracles, Zoroaster.

heavenly gift had been given, and to prepare themselves for its reception by fasting and special ceremonies.

As soon as the discovery was made it was the sign of a communication from heaven (*ex celo missum putant*), and the announcement was made to the pontiff of one of the three great colleges (of Gaul).

The next business was to arrange for the collection of the precious plant, and bards were sent forth in all directions to summon the people to the great religious ceremony. The words of the proclamation are believed to survive in the custom which prevails, especially at Chartres, the old metropolis of the Druids, in soliciting presents on the new year with the words, "*Au gui l'an neuf.*"

The tribes being assembled, with tumultuous joy, at the appointed spot, waited for the clergy, who arrived by torchlight leading the sacrifices. Three Druids of the first class, crowned with ivy, advanced with slow steps, one carrying the bread intended for offering, the next a vase filled with holy water, and the third a sceptre of ivory, the characteristic mark of the chief Druid.

The pontiff who was to gather the sacred plant then advanced to immolate the victims, and offer the sacrifice. He was dressed in a white robe and a rochet, carrying an ornament somewhat similar to a cross, which was also the custom of the priests of Egypt. He was shod with wooden sandals, crowned with oak leaves, and wearing a long beard which gave to his countenance a character of mysterious austerity. From his girdle was suspended, by a chain of precious metal, a pruning-knife of gold, having the form of a crescent. Behind the chief priest came the nobility, and then the people.

When all had arrived at the foot of the oak, three ceremonies had to take place : (1) the offering of the victims and the consecration of the oak ; (2) the gathering of the mistletoe ; (3) the distribution of the sacred plant, the sacrifice, and the festivities.

A triangular altar of wood was constructed round the trunk of the tree (*unity in the circle, and trinity in the altar*), from which the oak seemed to arise.

A circular tablet was appended to the tree, on which were written mystic letters signifying (according to Trémolière), *Dieu père, Lumière souveraine, principe de la vie qu'il donne au monde.*

The victims, two bulls, were then offered, and a Druid cast upon a fire lighted at each of the angles of the altar a slice of bread on which some drops of wine had been poured ; hymns to Teutates accompanying this portion of the ceremony.

These offerings being completed, the Arch-Druid ascended the tree by means of a ladder, and cut, without touching it, the branch of mistletoe with his golden falchion, allowing it to fall upon a white linen cloth which had never been used, the four corners of which were each held by young Druidesses or by Druid dignitaries. Great care was taken that it should not touch the ground.

Afterwards took place the distribution of the precious plant. Water in which the sacred mistletoe had been immersed was given to or sprinkled upon the people (*l'eau lustrale*). Then the branches were cut to pieces and divided amongst the assembled tribes in the midst of feasts and addresses. Then followed scenes not very dissimilar from some enacted under the pretence of religion to the present day.*

* The "Pardon of St. Ann" (to which I have seen the Bretons flocking in their picturesque costumes), may well be a "survival" of the above festival of heathenism, though now turned to the profit of the priest, and of the "Church."

I think the account of the altar much to be noted in connection with the Pythagorean notion of the Number Three, which either as a number or *in a triangle* denoted the *universe in connection with God*, the Absolute in itself, the Unconditioned.*

The whole subject of the golden branch reminds of the language of Isaiah (xlv. 8), "Drop down, ye heavens, from above, and let the skies pour down righteousness ; let the earth open, and let them bring forth salvation, and let righteousness spring up together," especially as the previous verse has by way of contrast to the dualism of the Persians. In Zechariah (xiv. 8) the typical branch is shown to be a person : "Behold I bring forth my servant, the BRANCH." "The primary idea of the Hebrew word is that of shining forth;"† so by a kind of play upon words, very common in the Hebrew, we have the word rendered 'Αναρολήν in the LXX. of Zechariah; and in the gospel, "*The dayspring from on high hath visited us, to give light to them that sit in darkness . . . to guide our feet into the way of peace.*"‡

Do we not then begin to see that the word DRUID may have been one full of meaning and of the loftiest possible pretension ? Does it not imply that as sacrificing priests they were mediators between heaven and earth ? Mystically they were alike, the oak (*Taronowy*) and the branch of pure gold which it bore. Each one of the mysterious confraternity partook of the divine majesty of the god of lightning, who was indwelling in the oak, and also of the heavenly qualities of the branch which it bore. Supreme dominion and the credit of possessing the properties of the "all-healing" plant§ of heavenly birth, were in themselves a large endowment, especially with the added attribute of the highest wisdom.

This derivation of the word suggested in the work above quoted appears to me probable. *Dru* or *Dar* (another form) "must have once signified equally an oak and the thunder;" and "the Thunderer is identified with the tree" in a passage of Taliesin quoted by Williams || to whom I refer for full elucidation of the subject, also for the proof that the Greek "Ιδη¶ is identical with the Welsh *gwydd*, so that we have in Druid the exact rendering of the oak and the mistletoe, "the branch"

* Smith's *Dict. of the Bible, sub voce "Tabernacle."*

† Ges. Lex. *in loco.*

‡ Song of Zacharias in Luke i.

§ *Omnia sanans*, Pliny ; "gruthil," German, *uchel-fel*, heavenly honey
Le Gui, pp. 76-77.

|| Gomer, p. 107.

¶ With the digamma.

including mystically all I have said.* The Chief Druid of his age was the priest and representative of the great luminary, A VISIBLE GOD upon earth.†

Pantheism.

The Bardic system teaches that God made all things out of Himself,‡ or in other words :

"From the particles which He collected out of the infinite expanse of the circle of Ceugant, and collocated in order and just arrangement in the circle of Gwynvyd as worlds, and lives and natures, without number, weight, or measure, which any mind or intellect but Himself could possibly foresee or devise, even if it possessed the endless ages of the circle of Ceugant.

"Of what materials did God make the worlds ?

"Of Himself, for existence having a beginning does not otherwise take place.

"How were animation and life obtained ?

"From God and in God were they found ; that is, from the fundamental and absolute *life*, that is from God uniting *Himself to the dead or earthliness* ; hence motion and mind, that is soul."

From this we must understand that God did not create the ultimate particles of matter, but found them in the Ceugant. So that we start with the absolute reversion of the grand truth so clearly propounded in the first verse of Genesis, that, in the beginning Elohim created or formed the ultimate particles of matter, both of the heavens and the earth.

We also learn that, instead of God being, as taught by Our Lord, HINEYMA, Spirit, He is *HU* the mighty, not to be known or understood apart from His creation.

"The smallest of the small
Is Hu the Mighty, as the world judges,
And the greatest, and a lord to us,
Let us well believe, and our *mysterious god*.
Light his course and active ;
An atom of glowing heat is his car.
Great on land and on the seas,
The greatest that I manifestly can have,
Greater than the worlds. Let us beware
Of mean indignity to him who deals in bounty."

The "mysterious God," as it is translated, is in the original "Duw Celi," that is to say, "God, the secret one;" reminding us much of Jupiter Ammon, which has the same signification, also of the altar to the Unknown God at Athens.

* Voila incontestablement, dit J. Regnaud, le type primitif de deux radicaux, *deru*, chêne, et *wydd*, gwydd, qui in Kimrique signifie *gui*, la plante par excellence. Le *Derwydd*, se retrouve dans le Breton *Droux*, qui signifie, non pas seulement "l'homme du chêne," mais "l'homme du gui de chêne." Regnaud.

† Davies, p. 296.

‡ Barddas, p. 257.

"The least thing is none other than God," for in every particle (of light especially) there is a place wholly commensurate with God (p. 17). It is not quite so clear what happens when light is absent, as we may see presently, but all corporeal things endued with *life* are constructed out of the particles of *light*.

I suppose we must consider that light may be latent as electricity, but as there is an awkward question about "*Cythrail*" in the darkness, all Bardic devotions must be performed in the light of the sun.

"Why is the face turned towards the sun in every asseveration and prayer?" (p. 263).

"Because *God is in every light*, and the chief of every light is the sun. The sun was designated *Huan*, or the abode of God (p. 264), therefore, in the act of worshipping as well as in the performance of every other solemn rite, they did all in the face of the sun and the eye of light, that is, in the face or before the face of him whom they regarded as living and existing in the sun and the light."

This is the explanation of a *Christian* president of the chair of Glamorgan, and perhaps not entirely correct, for we have seen (p. 257) that God is *united* (*ymgyfymgyd*) to "the dead" (*or marw*), hence we have the idea expressed in the following passage:—

"What material did God use in the formation of the world, namely, the heaven and the earth, and other things known and conceived (p. 261)?"

"The *Manred*, that is the smallest of the small, so that a smaller could not be, which flowed* in one sea through the Ceugant—God being its life and *pervading each atom*, and God moving in it, and changing the condition of the 'manred' without undergoing a change in himself. For life is unchangeable in all its motions, but the condition of that which is moved is not one and the same. Therefore, because God is in every motion (*ymmod*), one of God's names is *Modur*, and the condition that is moved is called *Modur-anawdd*."

Every particle of *Manred* may therefore be thus expressed. Let *M* stand for *Manred*, and *x* for the unknown quantity, or God, then

$$M + x$$

the smallest particle conceivable, but let *M* be multiplied by the number expressing all the particles in the universe, still this infinite number will be simply $+ x$, because God is one.

* This explains the component *rhed* which occurs in the word "manred," i.e. "flowing particles."

Something like this conception is expressed by Pope* in the following lines :—

“ All are but parts of one stupendous whole
 Whose body Nature is, and God the soul
 That changed through all, and yet in all the same.
 Great in the earth, as in the ethereal frame ;
 Warms in the sun, refreshes in the breeze,
 Glows in the stars, and blossoms in the trees,
 Lives through all life, extends through all extent,
 Spreads undivided, operates unspent,
 Breathes in our soul, informs our mortal part
 As full, as perfect, in a hair as heart ;
 As full, as perfect, in vile man that mourns
 As the rapt seraph that adores and burns.
 To Him no high, no low, no great, no small ;
 He fills, He bounds, connects and equals all.”

Contrast and Conclusion.

Pantheism in its refined form seems to me to be the highest effort of the natural mind in religion. We are told by the Apostle Paul that the natural man receiveth not the things of the Spirit of God, for they are foolishness unto him, neither can he know them, because they are spiritually discerned. It is, nevertheless, needful to man that he should have some sort of a religion, without which he is like a dog without a master. In pursuance of what may be called the religious instinct, he worships that which seems most superior to himself. In the first place, the sun, “ of this great world both eye and chief,” seems to claim his admiration. His beneficent power, as quickening all creation, is that which strikes us most who behold so little of his rays ; but in the zones more evidently under his dominion he becomes the mighty Baal, the far-darting Apollo, striking his enemies with irresistible force, slaying the powers of evil, typified under the serpent form, and honoured everywhere with human sacrifices. The moon, the apparently more gentle goddess (or god) received on the other hand the supreme homage of nations, presiding over fecundity—the planets also, as we are now learning afresh, having much influence on the destinies of this lower world. But out of all this Sabeism arises the more refined conception of *light* or *fire* as common to all these, and as either embodying or typifying that more refined principle which was supposed to animate all.

It is this form of idolatry which came to its culminating point in Persia, and seems to have pervaded Druidism and

* *Essay on Man*, p. 77.

the religion of the kindred races who peopled Ireland. The sacred fire of St. Bridget, and the Round Towers so evidently imitated from the fire-temples, attest this sufficiently. In that which remains to us traditionally embodied in the religion of the Bards, we trace the worship of the sun very distinctly, although this may be covered with the varnish of Christianity.

It was probably from an idolatry of this kind that Abram was separated when he was called forth from Ur of the Chaldees at the command of "the God of glory" to serve Him alone. The name of the city is now understood to be "Light," and this we must presume was then considered the highest manifestation of deity, though not excluding the grossest idolatry of any of the striking forms of nature—of idols representing these, or even of man himself as embodying a larger share of divinity than others.

The intense personality of the living God thus making himself known to the father of the faithful is in most striking contrast both to Pantheism and to its accompanying polytheism. God Almighty (*El Shadai*) made Himself known by (apparently) a personal call to Abram ("Jehovah had said to Abram"). We do not suppose (and indeed are told the contrary) that Abram beheld any shape or form, nor do we know the name by which Abram knew how to call the hitherto unknown God who spoke to him, unless it were as above.*

* We find the name "God," *El*, compounded with the name of at least one of the antediluvians, just as in the Chaldean records the name *Tutu* or Father occurs in the antediluvian name *Ubara-tutu* (servant of the father), applied to the father of Hasiadra or Noah, and we have much reason to believe that at that early age El, Bel (*not Baal*) and Tutu were equivalent. Melchizedek in worshipping El-elioun (the Most High God) worshipped the true and living God. It was not till the time of Moses that the Almighty revealed His name, *the tetragrammaton* which we call Jehovah. I cannot help thinking that the previous name was a *trilateral*, such as is found in "Beriah," for instance, before the time of Moses. It was either *JAH*, as we find it in the Psalms, or *IAΩ*,¹ as in the Greek verse said to be an oracular response of Apollo :

φράζεω τὸν πάντων ὑπαρον Θεὸν ἐμεν Ἰαῶ.²

Both of these are sufficiently near the *IAU* of the Bards to make me think that even the last may be the remembrance of a world-old tradition.

"Porphyry says that Sanchoniathon³ received information from Hierombalus, a priest of Iau."⁴ See also Cory's *Ancient Fragments*. Ed. 1876, p. 19.

¹ Certain ancient writers have stated that the God of the Hebrews was called 'IAΩ.'—Ges. *Lex.*, *sub voce* "Ιαώ."

Smith's *Dict. of the Bible*.

Since the recovery of the arrow-headed writing I presume the authority of this author will no longer be questioned.

⁴ Higgins's *Celtic Researches*, pp. 198 and 208.

In whatever way the revelation of God to Abram was effected, it must be regarded as one of the most stupendous events in the history of mankind. Three thousand six hundred years have passed away, and in every one of these years Abram and his seed have been marked under the eye of God as (whether faithful or unfaithful) the seed of Abraham his friend. The mind of man, ever searching into the unknown and the incomprehensible, should at least endeavour to *grasp* such a fact as this. To deny it or to explain it away seems alike hopeless; to admit it involves the admission of the Personality of the Almighty in opposition to all Druidism, Pantheism, Polytheism, and Natural Religion.

The God of Abram *loves*, seeks the friendship of a man, suffers him to plead with him as a friend, acknowledges that friendship, directs, refines and purifies the object of His choice, and takes him to dwell with Himself, where, according to the testimony of Christ, he is still *living*.

All this is, in my opinion, quite *above* reason, though in no way contrary to reason, for reason has no plummet to cast into this unfathomable depth. THE TRUTH can only be received by faith and spiritually; but, being received through divine teaching and in the appointed way of reconciliation, becomes the joy of the heart for ever!*

Pantheism may seem attractive in the hour of prosperity, but it has no remedial feature for the hour of adversity, no consolation against the darkness of the grave. Ask electricity to comfort you on the bed of languishing, or demand of elemental fire if it can purge away your sins, or fit you for the happy life of the blessed! Neither is water more effectual.

“Omne nefas, omnemque mali purgamina causam
Credebant nostri tollere posse senes . . .
Ah nimium faciles, qui tristia crimina cœdis
Flumineā tolli posse putatis aqua.”†

It is not the *Pantheist*, but the Christian, of whom it may be said with truth—

“His are the mountains, and the valleys his,
And the resplendent rivers. His to enjoy
With a propriety that none can feel
But who, with filial confidence inspired,
Can lift to Heaven an unpresumptuous eye
And smiling say, My Father made them all.”

* *κτήμα ἐς δεῖ.* See John, 2nd epistle, v. 2. † Ovid, *Fast.*, lib.

APPENDIX.

The Bardo-Druidic System.

THE promoters of the Welsh Eisteddfod, which was held at Llangollen in the autumn of 1858, offered a prize of £30, and a Bardic tiara in gold, for the fullest information, from original sources, of the theology, discipline, and usages of the Bardo-Druidic system of the Isle of Britain. This led to the production of a work compiled chiefly from the MSS. of the late Iolo Morganwg, one of the two that constituted the only members of the Bardic institution, when it was revived at the close of the last century. Of this the adjudicators speak in the highest terms, remarking :—

" When we consider that the *Gorsedd* of the Bards was but a continuation, in the White Island, of the circular temples of patriarchal times, we may feel assured that it is among the remains of Bardism, or the religious system connected with those primitive temples, we may hope to discover, if at all, that *Golden Key*, concealed and secured, which can open the mysteries, or esoteric doctrine, of ancient nations."

I have reserved for this Appendix a more elaborate examination of the work entitled *Barddas*, as I can scarcely expect of my audience to follow with the *Cyfrinach*, or sympathetic intelligence which is required, the details of this curious mysticism. It perhaps requires that one should have some of the old British blood in one's veins to understand it even with labour and study ; but having acquired it, the possessor may feel that he has indeed possession of the golden key, by which to open out stores of hidden wisdom, though that be indeed the wisdom of this world that comes to nought.*

This system as developed in " *Barddas*" † must be taken for what it is intrinsically worth, there being no sufficient proof of the genuineness of all its traditions. It is, nevertheless, exceedingly well worth study. It is a refined system of Druidism, made to conform as far as is possible with the teaching of Christianity.

It professes to derive from tradition (confirmed by Nennius‡) the origin of the Cymry from Javan, and asserts that Einiged the great, son of Huon, son of Alser, son of Javan, son of Japheth, son of Noah the aged, was the first who invented the *coelbren*—that is, "the wood of credibility," or record-stick, called by Taliesin, " *y gorwydd a gorail*." This being the early depositary of knowledge, led, as I conclude, to the same word being employed for both, *gwydd* signifying equally "a frame of wood" and "knowledge" ; for the *coelbren* was simply a frame of wood enclosing sticks on which letters could be cut with a sharp knife. The perishable nature of the material was a great disadvantage, leading of course to the destruction of all the early records of the Cymry, whilst the Accad people, who in early times were probably their neighbours, found in the plains of Babylonia the right substance, *clay*, which could be baked thoroughly, and thereby rendered indestructible, and so transmitted to us their learning and science, as Pliny says, " *or baked tiles*."

" Several words in the language which relate to knowledge and literature have a primary reference to wood. Thus : *arwydd*, a sign ; *cyfarwydd*, skilful ; *cyfarwyddyd*, information ; *cywydd*, a species of versification, also revelation ; *dedwydd*, having recovered knowledge, happy ; *derwydd*, a Druid ; *egwydder*, a rudiment, an alphabet ; *gwyddau*, a rudiment ; *gwyddon*, a man of science ; *gwynnidigion*, men of sacred knowledge." §

* 1st Cor. ii. 6.

† *Barddas*, or, A Collection of Original Documents, &c., illustrative of the Bardo-Druidic System. By the Rev. J. W. Abithel, M.A., 1862.

‡ " Extraditione veterum, qui incolae in primo fuerunt Britannie."

§ From *Barddas*, p. 13, note.

"*Derwydd*, a Druid, compounded of *gwdd*, a wise man, and *dew*, the oak. *Der-lwyn* and *llwyndern*, an oak grove, are among the commonest names of places in Wales. *Dew* is evidently cognate with the Greek root $\delta\rho\nu$, as seen in $\delta\rho\nu\omega\kappa$, an oak. Hence the Greek word compounded from $\delta\rho\nu$ and *gwdd* took the form of $\delta\rho\nu\cdot\delta\cdot\eta\zeta$; in Latin, *Druida*."^{*}

"Bran the blessed," the father of Caractacus, is said to have learned a different mode at Rome, where he was detained as a hostage, and brought it with him to Britain, where he taught it to the Cymry, as well as the dressing of the skins of kids and goats, so as to be suitable for written letters. This latter became customary, so that the old method was only preserved by the bards for secret communication, and for the preservation of their knowledge when it became prohibited.

According to this system, the commencement of writing was the making known the ineffable name of God.

"When God pronounced His name, with the word sprang the light and the life, for previously there was no life except God Himself. And *Menw* the aged, son of *Menwyd*,† beheld the springing of the light, and its form and appearance not otherwise than thus—



in three columns, and in the rays of light the vocalization—for one were the seeing and the hearing, one unitedly the form and sound."

"*Menw*, on hearing the sound of the voice, obtained the three letters, and knew the sign that was suitable to one and other of them. Thus he made in form and sign the name of God, after the semblance of rays of light."

"It was from the three primary letters that were constructed every other letter, which is the principal secret of the bards of the Isle of Britain."

The sense of O was given to the first column, the sense of I to the second column, and the sense of V to the third.

"That is to say, it was by means of this word that God declared His existence, life, knowledge, power, eternity, and universality. And in this declaration was His love; that is, co-instantaneously with it sprang like lightning all the universe into life and existence, co-vocally and co-jubilantly with the uttered name of God, in one united song of exultation and joy."

"It was thus then that God made the world, namely, He declared His name and existence."

"No man ever heard the vocalization of His name, and no one knows how to pronounce it."

"Formerly signs were employed, namely the three elements of vocal letters" (vowels). However, to prevent disrespect and dishonour to God, a Bard is forbidden to name Him except inwardly and in thought.

These signs being cut on wood, were called *llythyrau* (letters). Sixteen letters were constructed out of the principal columns, and two were afterwards added, and other two completing the sacred number‡ of twenty.

"They were first made on trees: that is, wood was hewn into four-sided staves, on each of which were cut small notches, and it was by means of as

* Gomer. By Archdeacon Williams, p. 105.

† "The words *menw* and *menyd*, which are here used as proper names, signify the source of intellect and happiness, the mind or the soul, being derived from *men*, an active principle;" compare *mens*, $\lambda\sigma\omega\kappa$. *Man* also comes in here as originally a being possessing *mind*.—*Manuscha*, Sanscrit.

‡ "In Awen."—Taliesin.

many notches as were necessary that letters were formed. After that, on a slate stone ; that is, letters were engraved on it with a steel pencil or a flint." The lettered stone was called *cœlbrain*.

The first ten letters were the following* :—

a, p, c, e, t, i, l, r, o, s, called *Abcedilros*.

In the second age, sixteen letters were arranged, whence literature became more clear.†

In the third age, there were eighteen letters for the improvement of literature ; in the fourth age, twenty-four.

According to Cæsar, the Druids in their public and private accounts used Greek letters ; but there were some things, such, probably, as the name of God, which they did not deem it lawful to commit to writing.

"The three primary letters," and "the principal secret of the Bards," reminds of the history of Sanchuniathon, who records the fact that Isiris, the *inventor of the three letters*, the brother of Chna (Canaan), who is called the first Phœnician, was instructed in certain mysteries by the prophets who *superintended the mysteries and taught the initiated*.

I will add the passage in the Appendix for the information of those who can compare the account with the worship of Demeter as Eleusis, of the Cabeiri, and of Bacchus. Was the same secret worship common to these initiated ones, and to the Druids ? and have we to look for a Phœnician origin for the religion ?

Whatever may be the answer to these questions, I think it can scarcely be denied that all this speculation about the rise of letters looks back to an early period of the world's history.

Cadmus is said to have introduced into Greece, from Phœnicia, an alphabet of sixteen letters, so that the "letters" may after all have been imported into both countries from the same quarter.

In order to explain the religious system of Bardism, it is necessary to recur to their three different circles. *Ceugant*, then, is to them the infinite expanse which symbolizes with the *τὸ ἀτεῖλον* of Pythagoras, "an undefined and infinite something" in which were found the points or monads, the *αρχαὶ*, the beginning of all things.‡

It seems to produce in the disciples of Bardism a sense not only of awe, but of something akin to the revulsion of feeling that one experiences in suddenly being placed on the brink of a precipice. "God only can endure to traverse the circle of *Ceugant*" (p. 233), and in attempting to do this and to become gods the first created mortals fell into *Annwn* as the just punishment of their pride.

They were created in the circle of *Gwynnyd* (p. 259), that is, of white or happy life, "thoroughly good" (p. 253), for "where God exists in every atom

* Irenæus says ("Ad. Haer." 2, 41), "The old and first letters of the Hebrews which are also called sacerdotal are in number ten, but everything is expressed in writing by means of fifteen."—Kenrick's *Phœnicia*, p. 162.

† "The primitive Greek alphabet is attested by many authorities to have consisted of only 16 letters, which have been thus enumerated :—

α β γ δ ε ι κ λ μ ν ο π ρ σ τ υ

and these are called Phœnician letters."—Kenrick's *Phœnicia*, p. 161.

"Quippe fama est, Cadnum, classe Phœnicium rectum, rudibus adhuc Græcorum populis artis ejus auctorem fuisse temporibus Trojanis memoravit xvi litterarum formas."—Corn. Tacit. *Ann.*, lib. xi. 16.

‡ Smith's *Dict.*

of *manred* evil is impossible, because there neither is nor can be room for it, since God and all goodness fill the infinitude."

This grand event took place (p. 259) "by the voice of his mighty energy, that is, by its melodious sweetness, which was scarcely heard when, lo ! the dead gleamed into life, and the non-entity which had neither place nor existence flashed like lightning into elementation, and rejoiced into life ; and the congealed, motionless shiver warmed into living existence, the destitute nothing rejoiced into being a thousand times more quickly than the lightning reaches its home."

All this is very pretty and poetical, but how evil first entered I am not bard enough to determine. *Abred* is the *cylch* or circle of evil, of which *Annwn* is the depth, and the "dogs of *Annwn*" were still occasionally seen by the Tam-o-Shanters of Wales in this century.*

Evil having entered, it has become necessary (p. 233) that "every living and animate being should traverse the circle of *Abred* from the depth of *Annwn*, that is, the extreme limit of what is low in every existence endued with life, and they shall ascend higher and higher in the order of gradation of life, until they become man, and then there can be an end to the life of *Abred* by union with goodness.

"But no man shall at death go to *Gwynvyd* except he who shall attach himself in life, whilst a man, to goodness and godliness. The man who does not thus attach himself to godliness shall fall in *Abred* to a corresponding form and species of existence of the same nature as himself, whence he shall return to the state of man as before. And then according as his attachment may be to either godliness or ungodliness shall he ascend to *Gwynfyd*, or fall in *Abred* when he dies. And thus shall he fall for ever, until he seeks godliness, and attaches himself to it, when there will be an end to the *Abred* of necessity and to every necessary suffering of evil and death."

"Independently of Bardism,† it would be difficult to explain why *adwyd*, a term signifying *reworld*, or a beginning of the world over again, should in common use stand for adversity. It was originally applied to the state of retraversing *Abred*, which being a punishment for sin was, of course, a state of hardship and adversity."

The Welsh Trinawd.

I do not think this had originally any connection with Christianity.

The Chinese philosopher Lao-tsen, who flourished according to Chinese chronology about the sixth or seventh century B.C., and held the opinions commonly attributed to Pythagoras, writes thus :—‡

"Celui que vous regardez et que vous ne voyez pas se nomme J. Celui que vous écoutez et que vous n'entendez pas, se nomme Hi. Celui que votre main cherche, et qu'elle ne peut pas saisir, se nomme Wei. Ce sont trois êtres qu'on ne peut comprendre, et qui confondus n'en font qu'un." J.H.V.

The Chinese interpreter of the passage maintains that these mystical letters signify "*the void*." In this we seem to trace the *τὸν ἄκηπον* of Pythagoras, and also the doctrine of the Druids, as above stated ; also the *Nirvana* of the Buddhists.

* For the goblin huntsman, Arthur, and dogs of *Aunwn*, see *Brit.*, p. 116.

† *Barddas* Preface, p. xxv.

‡ As translated by M. Rémusat, Smith's *Dict. of the Bible*, sub voce "Jehovah."

The Creation.

"DISCIPLE : With what material did God make all corporeal things endued with life ?

"MASTER : With the particles of light, which are the smallest of all small things, and yet one particle of light is the greatest of all great things, being no less than material for all materiality that can be understood and perceived as within the grasp of the power of God. And in every particle there is a place wholly commensurate with God ; for there is not and cannot be less than God in every particle of light, and God in every particle ; nevertheless, God is only one in number. On that account every light is one, and nothing is one imperfect co-existence but what cannot be two, either in or out of itself."

"QUESTION : How were animation and life obtained ?

"ANSWER : From God and in God they were found ; that is from the fundamental and absolute life ; that is from God uniting himself to the dead, or earthliness ; hence motion and mind, that is, soul. And every animation and soul are from God, and their existence is in God, both their pre-existence and derived existence ; for there is no pre-existence except in God, no co-existence except in God, and no derived existence except in God and from God."*

Names of God.

Amongst other terms which seem to have come down from the times of heathenism,† is one which demands particular notice, since (as observed by the Editor of 1876 edition of Cory's *Ancient Fragments*) "we learn from an Assyrian inscription of Surgon's that the correct pronunciation of the most sacred name of God amongst the Semitic people was Ya-u, or Yâhu;" it is the same in Welsh !

IAU.

"DISCIPLE : Why is Iau (yoke) given as a name of God ?

"MASTER : Because the yoke is the measuring rod of country and nation in virtue of the authority of law, and is in the possession of every head of family under the *mark of the lord of the territory*, and whoever violates it is liable to a penalty. Now God is the measuring rod of all truth, all justice, and all goodness, therefore he is a yoke on all, and all are under it, and *woe to him who shall violate it.*"

Is not this the origin of the broad arrow ↑ stamped on all to which attaches the inviolability of that which belongs to the sovereign ?

The Pelasgi.

The Pelasgi worshipped Ceres in groves similar to those of the Britons, as we learn from Callimachus in his hymn to Ceres.‡

Τίν δάντρα καλύν ἄλσος εποιήσαντο Πελασγόι
Διέδρεσιν ἀμφιλαρές διά τεν μόλις ἥλθεν ὄντος
Ἐν πίτυς ἐν μεγάλαι πτελέαι ἴσαν, ἐν δέ καὶ ὅχναι
Ἐν δὲ καλά γλυκύμαλα—τό δῶς ἀλεκτρίνον ψώωρ
Ἐξ ἀμάραν ἀνεθένε.

* *Barddas*, p. 257.

† *Duw*, *Dofydd mawr* (the great tamer); *Ionaur*, *Iau*, *Ener*, *Muner*, *Ner* (the powerful); *Naf* (the creator) *ydyw*.

‡ *The Testimony of Profane Antiquity*. Bridges, p. 75.

"Sacred to thee, a beauteous grove was seen
So thick, an arrow could not pass between,
By the Pelasgi planted round thy shrine,
There the elm rear'd her stately head—and pine
Coniferous. There the pear and apple grew,
Sweet to the taste and tempting to the view."

I think that I need say no more to prove that circular temples, open to the sky, were devoted to the same worship among the Thracians and the Britons. The mysteries of Demeter were common to both. The analogy of language is, perhaps, greater than usually suspected, and at all events very marked in connection with the oak-religion, and consequently with the Druids. The Welsh traditions trace the migration of the Cymry from exactly the same region—*Gwlad yr Haf*, the land of Summer, interpreted to mean where Constantinople now stands, but also called Taprobane, i.e., apparently the valley (*dwyfryn*) of Albania. If this tradition be correct, it necessarily leads us back to as ancient a date for this movement of the Welsh as for that of the old Etruscans and other colonists of Italy.

**WORKS (IN THE AUTHOR'S POSSESSION) WHICH HAVE
BEEN CONSULTED.**

The CHAIRMAN.—I have now on behalf of this meeting to return thanks to Mr. Howard for the very learned and interesting paper he has just read. "Learned and interesting" are two attributes that are not always joined together. Sometimes we have papers that are learned and not interesting, and I have also heard papers that have been interesting without being very learned, but here we have both together. (Hear, hear.) We shall now be happy to hear any remarks that may be made upon the subject.

Rev. J. FISHER, D.D.—The paper is one that is interesting to several classes of people. It is interesting to the linguist, to the ethnologist, and, in a certain way, to the historian and to the Christian. The writer has, I think, shown us that man did not come hither in an uncivilized or savage state. Mr. Howard has said, the language of the Welsh people is a philosophic language which evidently was not gathered in the first instance from men grunting or barking, and from that gradually developed into so noble a language as that of the old Gaul. I think it would prove a very interesting and useful study if someone who has the time at his disposal would take the hint and give us something like a dictionary of all those words, whether names of places or names of men, or whatever else, that are really Gaelic in origin. (Hear.) There is no fear, however, of their being lost, for I have no doubt that the manuscripts and books we have will suffice to preserve the language. It certainly would be a great pity that it should be lost or displaced. Of course it is abundantly apparent that the English language is displacing other languages in many countries. It appears very clearly from Mr. Howard's paper that our ancestors far away in the olden days had a knowledge of, and believed in, the unity of God. For my part I believe that that word Belus—Baal—is the same in the Babylonian, Phoenician, Celtic, and so on. Our old "May-day" in this country was "Beltina," the "Fire of Baal;" and to this day May-fires are kindled in Ireland.

The CHAIRMAN.—May I here introduce what I have thought might be a very interesting passage from this book, to which Mr. Howard has not alluded. It is a passage from *Ammianus Marcellinus*, who was a soldier in the army of Julian, and who lived in the time of Theodosius. Writing at the date A.D. 370, he makes remarks on the subject of the religion of the Gauls, and says pretty much what Strabo says. He writes something like this:—"In this country men are generally trained up in the pursuits of laudable doctrine or laudable learning furnished largely from the Bards, Euhages and Druids." "Euhages" is the spelling given here, but that is wrong; it should be "Euhates," but Ammianus spells the word "Euhages," meaning to express what is expressed by Strabo's book by Ouates, or, as the Latins wrote it, "Vates" (one of the words which shows a connection between the Latin and the Celtic), therefore the three orders of the Bards were the Bards proper, the Vates, and the Druids. "The Bards," he says, "wrote the deeds of illustrious men in heroic verse, and sang them with the sweet accompaniment of the lyre; the Euhages examine into the order and mysteries of nature, and endeavour to explain them; the Druids

are far higher in their flights, being, as the authority of Pythagoras declared,"—he distinctly makes them out to have been Pythagoreans,—“bound together in a brotherhood and applying themselves to questions as to matters secret and of great subtlety; and, looking down on human things, they declared that souls were immortal.” This is a short but interesting passage in relation to this subject, and it shows what knowledge an officer in the army of that time, half Greek and half Roman, possessed. He probably got it from Strabo. At any rate, he had the knowledge; and as the extract, which is probably taken from his commonplace book, seemed to me to be of some value, I have given it to you. (Hear, hear.)

Mr. D. HOWARD.—Of course, the question of the precise antiquity of Stonehenge is almost insoluble; but there is one thing that has always seemed to me not to have been fully taken into account in considering the history of Stonehenge. I think it is plainly shown that the Roman dominion must have overlapped the actual use of Amesbury and Stonehenge and the state of civilization which they disclose. When we examine not merely Stonehenge, but the whole of the district of Salisbury Plain and the range of chalk hills running down into Dorsetshire, we find a complete set of fortresses on the high ground as far as the vast camp of Amesbury. I may say that every convenient bluff of chalk is usually fortified by works that were evidently intended to be effective against horses and chariots rather than against foot-soldiers, for there are deep trenches cut just across the neck of land where it would otherwise be possible to bring up cavalry, and these are not found on the sides where active foot-soldiers might very well fight their way up, but where it would be impossible to bring up horses or wheeled vehicles. These fortifications were carefully engineered by the Romans, some of them being occupied as Roman camps, as was evidently the case at Bradbury Rings and Old Sarum, and also at Hod Hill, where one can see the site of the old Roman camp in the midst of the vast camp surrounding it. These places, it is apparent, were used as fortresses at the time of the Roman dominion. Therefore, assuming that the Amesbury rings may be older than the Roman rings of the same appearance, and that there are no signs of their being newer, or of having been actually used as fortresses by the British at the time of the Romans, who put their camp in the middle, and had roads cut from one fortress to another,—assuming that the Stonehenge and Amesbury rings, temples, and so forth, really belonged to an antecedent period in the 500 historical years during which the Druids existed before that time, that will allow a considerable antiquity to the period in which they were in use; and as they certainly were used at the time of the Roman dominion, they are therefore brought down to a comparatively modern time. You will find in the chalk countries Roman camps exhibiting a perfectly startling clearness of cut, so that the vallum and all the works are surprisingly easy to trace, although many of them have been completely lost sight of by being so entirely covered by coppice that it is only when the coppice is cut you can find them.

Rev. S. WAINWRIGHT, D.D.—Among those referred to by Mr. Howard in his valuable paper are the Pelasgi, and after a reference to Herodotus he says, research tends to “connect” the Welsh with this vanished nation—you will observe he does not use the word “identify,” as some rather enthusiastic writers have;—but this connection of later nations with the earlier is one of the not least interesting of the obvious results of studies of this kind, which also show a common origin in respect to religious usages that have sprung from religious beliefs, while in the next place they lead us to a consideration of what have been the results of the migrations of different members of the human family; results which have led a man like Professor Rawlinson to say that the tenth chapter of Genesis is our “sheet-anchor” after all, in investigating questions as to the human family, where we note that one branch being pastoral settled here, another with different tendencies went to another region, &c.; and not only do we note that tendencies of this kind were in operation, but that they were favoured by the necessities, urgencies, and exigencies of the time about which nations were divided into peoples and among the lands after their tongues. I hope, therefore, that what might be otherwise regarded as Mr. Howard’s dry linguistic notes will be seized on by readers as furnishing a *terminus a quo* from which we may push our researches. With regard to the Welsh language, there are those who would pull down a church, though they could not, to save their souls, build up a hovel, and I must say that attempts to eradicate the Welsh language are not to the advantage of civilization. To those engaged in philological research the Welsh language is of inestimable value as affording a landmark in the history of the world. It has the distinctive features of an original language; the names of things not indigenous have quasi-European names; whilst those which are indigenous are indigenous to the language itself. It is not so even with Hebrew, which consists of elements derived from other languages and at remote dates. Going back to the question of the Pelasgi, we find they came from the East, and if we read what Lightfoot says about an immigration from Chaldea to the shores of the Black Sea, we shall see that in the Galat or Kelti we have the Celts or Cymri of the present day. You have traces of this idea in the “Old Testament” where the pillar dividing the possessions of Jacob from those of Laban was called Galeed by the one and Jegar-sahadutha by the other. For Abraham and Laban spoke the language of Mesopotamia; but Abraham having gone to the Canaanitish region, and adopted the language he found there, Jacob was born and bred to use the language which his father and mother had used, namely, that which we call Hebrew. Mr. Howard alludes to the Pythagorean system, and also to that of the Gnostics; may I say in regard to the Gnostics of our day that there is no dictum of modern gnosticism more misleading than that which asserts, “Law does this,” “Law does that.” Law never caught a thief and never hanged a murderer: it is the power at the back of law which incites law to this or that end. Let us have done with all this; and we shall have done with it as we fall back on the simplicity of that first faith which is at the root of all Religion. (Applause.)

Mr. J. E. HOWARD.—I have to thank all the speakers for the very kind and favourable way in which they have referred to my paper, and I would now, very briefly indeed, endeavour to gather up one or two points to which alone it seems to me to be necessary to allude. With regard to the Pelasgi, to the mention of whom Dr. Wainwright referred, I may say that the study I have given to the subject has brought before me, very unexpectedly, the connection between the Greek,—particularly the Thracian element,—and the Welsh; and I find this confirmed in “*Barrdas*,” in which work the origin of the *Cymry* is derived from *Javan*. *Javan*, we know from the Scriptures, represented the Greek element—not the Hellenic, but that of northern Greece. I would also refer you to “*Gomer*,” by Archdeacon Williams, for some very remarkable connections between the abstract philosophical elements of the Welsh and the Greek languages. I would mention with reference to the Baal fires, that I have seen the ashes of these fires in Brittany. A circumstance occurred to me which shows how important it is to understand Welsh in order to get at the etymology of places even in this country. A clergyman,—a friend of mine—living in the neighbourhood, took me to the top of St. Ann’s Hill, in Wiltshire, for the sake of showing me the prospect. He told me the common people said: “It is not ‘St. Ann’s Hill,’ it is ‘*Tan Hill*.’” I said: “‘*Tan Hill*’ is ‘The Fire Hill’—the hill on which the beacon blazed.” This connection of “*Tan*” with “*St. Ann*” is also found in Brittany, and the Feast or Pardon of St. Ann is held on the same day as that on which there is a cattle-fair on St. Ann’s Hill in Wiltshire. This is just one instance of how a little knowledge of Welsh sometimes helps us in getting at the origin of an English word. (*Tan* in Welsh is “fire.” Trydan, “*pervading fire*,” is the electric fluid.)

The meeting was then adjourned.

ORDINARY MEETING, JANUARY 19, 1880.

**THE REV. ROBINSON THORNTON, D.D., VICE-PRESIDENT, IN
THE CHAIR.**

The minutes of the last meeting were read and confirmed, and the following elections were announced :—

ASSOCIATES :—Rev. G. H. Fielding, M.A., London ; T. Gwyther, Esq., M.B., Torquay ; H. C. Malden, Esq., M.A., Brighton ; J. Foster Palmer, Esq., L.R.C.P., M.R.C.S., London.

Also the presentation of the following Work for the Library :—

“United States Geological and Geographical Survey bulletin.”
From the same.

The following paper was then read by the Author :—

**A CRITICISM ON PROFESSOR FERRIER'S “THE
ORGAN OF MIND.”** By the Rev. J. FISHER, D.D.

THIE paper which we criticise is one of considerable length, occupying twenty - eight pages of the *Princeton Review*.

Professor Ferrier writes in academic style, and somewhat technical language ; yet he is fairly easy of comprehension.

Almost at the outset he advises “the psychologists * and physiologists to join hands” ; but, as he writes from the stand-point of mere physiology, he soon drops our grasp.

The paper might be divided into two parts,—“brain, the

organ * of the mind," and "brain necessary to the movements of the limbs." But these parts are so mixed that an ordinary reader cannot easily separate them.

That part of it which refers to "brain necessary to the movements of the limbs" has not so great a degree of interest for us as for the physician, and we have little to say of it by way of criticism.

Some nine pages are chiefly occupied with the brain and nervous system as "necessary to the movements of the limbs"; and with describing the effects of lesion, or removal of the cerebral hemispheres, causing thereby paralysis in different classes of animals.

This part of the paper tells us, that "when the cerebral † hemispheres are removed in the frog, the consequences are not such as to indicate any very striking alteration in the powers or capabilities of the animal"; though it then "acts ‡ only in direct response to some form of sensory stimulation."

"What is true of the frog is" said to be "applicable to fishes § deprived of their cerebral hemispheres."

"In the case || of pigeons the phenomena are similar." But, "when we pass to mammals, we observe effects somewhat different from those seen in the classes of fishes, reptiles, and birds."

"The dangers ¶ to life," we are told, "from lesions, or complete removal of the cerebral hemispheres, increase as we rise in the animal scale." "In rabbits the destruction of the cerebral hemispheres impairs the motor powers to a marked extent, and more especially in the fore-limbs." "In cats and dogs the degree of paralysis is much more marked." "In the monkey, again, the paralysis of the limbs from lesions of the hemispheres is still more complete." And, "in man,** the annihilation of the functions so paralyzes all the muscular powers that only the vegetative functions remain."

Knowledge is desirable, and to be sought after; but it is a question whether the knowledge man has gained by operating on and removing the cerebral hemisphere or hemispheres of the lower animals be an equivalent for the pain and torture suffered by the animals on which the operations were performed.

There are other interesting facts brought out in this part of the paper, such as that "the brain†† is composed of two halves,

* Page 99.
|| Page 102.

† Page 101.
¶ Page 103.

‡ Page 102.
** Page 104.

§ Page 102.
†† Page 107.

each acting only on the opposite side of the body," that "extensive* lesions in one hemisphere, or destruction of the whole hemisphere by disease, may occasion no mental impairment"; that "destruction† of one hemisphere paralyses the opposite side"; that "the movements‡ of the tongue are almost completely bilaterally organised in each hemisphere," that "destruction of the lingual centre in one hemisphere does not paralyse the lingual movements"; that sometimes a person "can move his tongue§ and know the use of an object, but cannot name it."

We are thankful to the Professor for what he has told us of the connection of the brain with different parts of the body, and of the effect which the removal of the cerebral hemispheres or their destruction or lesion has on the power of motion of the limbs. But we do not agree with much that he says of brain as "the organ of mind," and we do not think that he has written at all correctly on this side of the question.

This is not to be wondered at. He is a physician, and may be fully competent to write on all departments of his profession. But mind belongs to intellectual or mental philosophy, a field and a study quite different from those of the anatomist.

Besides, the person who writes on mind needs to have been disciplined in the classes of the logician in order to acquire accuracy in the definition of terms, and precision in the use of language. That Professor Ferrier is not sufficiently accurate in the definition of his terms, and sufficiently precise in the use of his language, will be manifest as we proceed with our criticism.

The paper tells us that "the brain is the organ of the mind," but it does not define or give us the meaning of any of these terms. It does not tell us what we are to understand by *organ*, *brain*, or *mind*.

We do not object to the phrase, "brain the organ of mind," when used in a popular sense. But in a physio-psychological paper, or rather in a learned, scientific, and abstruse essay, on one of the great questions of the day,—the bearing of physiology on psychology,—especially as the writer tells us "the chief || object of the paper is to indicate some of the more important results of recent physiological and pathological researches into the functions of the brain, and their bearing on psychological questions,"—we do desire a clear definition of the terms, at the outset, and the use of very precise language in the whole treatment of the subject.

* Page 106.

† Page 107.

‡ Page 109.

§ Page 117.

|| Page 100.

Organ

is an instrument constructed by man for some definite purpose. It is wholly passive, and requires man to operate upon it.

A musical organ is an instrument "built" by man, for the purpose of producing musical sounds; but, in order to these sounds being uttered, the organ needs to be played on by man.

"Organ" is also the name given to a part of the human frame by which we have sensations. There are five organs, viz., the organs of sight, sound, smell, taste, and touch. The organ of touch is situated in every part of the frame, all the others are local, as that of sight, confined to the eye. All these organs are passive, and require to be operated on *ab extra*, just as the musical organ requires to be operated on *ab extra*.

And "organ" is the name given to a part of the human frame by which we do a certain act or work,—as the tongue by which we speak, the hand by which we write, and the foot by which we walk. These organs are also passive, being acted on by the will, or the Ego who wills the word or the act.

In the use of the word "organ" this distinction between active and passive should not be lost sight of; and we should remember that the organs of sense are always passive, requiring to be acted on; the organs of sight, sound, and smell, by waves of light, sound, and odour respectively; the organ of taste by sapid particles; and the organ of touch by something external to it.

Before we pass from the word "organ" we notice a mistake which the Professor has made with regard to the organ of speech, when he says, "articulate speech*" gives man his special predominance over the other animals."

Speech is, indeed, an important faculty; but it is not "that which gives man the special predominance over the other animals." A considerable number of the human race have not the faculty of speech. Are we on that account to reduce them to a condition approximating to the other animals? It would appear so, if "speech give the special predominance." And some other animals make an approach towards "articulate speech"; must they, therefore, be more approximated than their fellows to the human race?

We admit that "articulate speech" makes one difference between man and the lower creation, and that the power of generalizing and framing abstract conceptions makes another;

* Page 116.

but the "special predominance" that man has over other creatures arises from his moral nature.

Man has a conscience, a witness for God, within him, which none of the lower orders have. He is a religious being, and this gives him his "special predominance over all other animals."

It has been well said that "man is man* from his mind; for the mind constitutes the man; and such as is the mind such is the man. By mind is here meant that which belongs to the intellect and will of man, and, therefore, his veriest life. Those who are stupid suppose that man is man owing to his outward form; those who are less so assert that man is man from the circumstance that he is able to speak; and those who are less so still say that man is man from the fact that he is able to think. Man, however, is not man owing to any of those things; but from the fact that it is in his own power to think† what is true, and to will what is good; and that at the very time when he is thinking what is true and willing what is good, he is able to have an intuition of the Divine Being, and receive Him in a perceptible manner. In this it is that man is distinguished from brute animals."

Speech, in so far as it is produced by movements of the tongue, causing certain sound-waves, belongs to the phusis—to physiology. Speech, however, is not the result of the action of man's organs, but of the mind within him, which guides and controls him, and in so far belongs to the psuche—to psychology.

A necessary caution in this matter is, not to confound the organs with the person who has the organs. "Perception† must be the act of some being that perceives. The eye is not that which sees; it is only the organ by which we see. The ear is not that which hears; it is only the organ by which we hear. It is the spirit of the living man which sees and hears. And so of the other organs."

Brain

is a material substance, consisting of invisible atoms. It is a part of the phusis of physical nature, and belongs to physiology.

As the brain is a material substance, it has the properties, attributes, and qualities of a material substance. Extension, resistance, hardness, softness, weight, colour, roundness, circularity, are properties of brain.

* Gorman's *Psychology*, p. 287.

† Hamilton's *Reid*, p. 246.

The brain is not by itself alone an organ, by which we have sensation. It is in connection with the whole nervous system, specially with the spinal cord, which may be regarded as the true nerve-centre ; and thus the whole nervous system, "nerves* and brain together, forms the sensorial organism essential to the immediate production of those mental phenomena which constitute our sensations."

"The nervous† matter is of the same texture as the substance of the brain, in continuity with it, and forming one mass," and the whole system is built up of nerve-threads and nerve-corpuscles. Sensory nerves† go from the periphery to the brain, and motor-nerves go from the brain to the muscles." And, as the whole nervous system forms one organism, the sensorial affection may be immediate, and not progressive.

The Professor admits that the whole organism is necessary. He speaks of "certain" centres§ in the spinal cord, medulla oblongata, cerebellum, mesencephale, and basal ganglia"; and again he says, "it is not merely the brain . . . but the brain in connection with the whole sensory and motor apparatus to the tips of the fingers."

It thus appears that the organism of sensation is "a complex apparatus," the brain being only a part of it, and the other parts being as essential as the brain.

Now, to call the brain a single organ, and afterward to slip in the whole nervous system along with it, is not according to correct definition and precise use of language. It is also contrary to sound logic, and seems as illogical as reasoning from a particular term to a universal; though it is quite in harmony with the author's speaking of "mind|| incerebrate and mind incorporate" as synonymous phrases.

Instead, therefore, of saying, "The brain is the organ of the mind," we should say the whole nervous system, brain, spinal cord, and nerves, to the soles of the feet, as well as "to the tips|| of the fingers," forms an organism, through which, by means of the five organs of sense, the mind is furnished with sensations.

The brain is connected with all these organs, and as all these are passive, so is the brain a passive instrument, and not a self-acting machine.

The brain is not *one* but many, divisible into numberless atoms, "which exist near to each other, but are as little one as

* Brown's *Philosophy*, i, pp. 448, 458.

+ *Ibid.*, p. 445.

† *Fortnightly Review*, vol. xviii., p. 718.

§ Pages 104, 112.

|| Page 99.

|| Page 112.

if they existed in different planets of our solar system, or in planets, or suns of different systems.*

The brain is always changing. "The cerebral cortex,"† says the paper, "is constantly receiving new accretions, and undergoing novel combinations." As well as every other portion of our visible body, our brain "is transitory,‡ undergoing ceaseless flux." And, even if science succeed in detecting all the movements of the brain, it would only be the external mechanical movements that would be discovered.

Mind

is a spiritual substance, and belongs to psychology; and "an enumeration of its various states constitutes our definition of mind."§

"Mind is that which reasons, imagines, wills, loves, fears, perceives, remembers, compares, is susceptible of all the various emotions, and is the only subject of feeling and affection."||

Mind is One.

"The mind is one, and indivisible.¶ Our feelings are states of something which is one and single, not a plurality of substances; for the principle of thought is not divisible into parts." That the Ego is one, we need no other witness than our own consciousness; and "the unity of consciousness is a fact known to us by much better evidence than the existence of matter."**

"The sentient mind is essentially one, not extended and divisible, but incapable by its very nature of subdivision into integral parts, and known to us only as the subject of our consciousness in all the variety of successive feelings which we comprehend under that single name."††

But though not capable of division, it is capable of extensive analysis, as it exists in different states; yet every thought and feeling is as single and indivisible as the mind itself, being the mind existing at a certain moment in a certain state.

Mind a Substance.

We have said that mind is a spiritual substance. But may it not be an imaginary, rather than a spiritual, substance?

* Brown, vol. iv., p. 410.

† Page 124.

‡ Contemporary Review, vol. xxv., p. 128.

§ Brown, vol. i., p. 292.

|| Ibid., p. 157; vol. iii., p. 66.

¶ Ibid., vol. iv., p. 421.

** Cook's Lectures, p. 60.

†† Brown, vol. iv., p. 424.

As Lewis says that "the idea of spirit, as separate from matter, is imaginary."* Or may it not be the shadow of something, "the suggestive aspect of something," as others appear to say? Or may it not be beyond our power to conceive of mind as a substance, as Professor Allman says "the power of conceiving of a substance different from that of matter is beyond the limits of human intelligence?"†

Substance means that in which properties and attributes inhere. Attributes and properties imply a substance of which they are the manifestations. They cannot exist separate from substance. Fear must exist in some mind; and colour must exist in some body.

There are two substances in nature,—matter, of which the human brain forms a part; and spirit, of which the human mind forms a part. And we have as clear ideas of mind as we have of brain, the essence of each being equally unknown to us. "Sensation convinces us that there are extended substances, and reflection that there are thinking ones. We perceive not the nature of extension clearer than we do of thinking."‡

The attributes and properties of one substance cannot be transferred to another. The attributes, properties, and qualities of mind cannot be predicated of material brain atoms; and the attributes, properties, and qualities of brain atoms cannot be predicated of mind.

"Anger and fear are qualities incapable of being exhibited as functions of brain matter"§; and, on the other hand, extension, resistance, gravity, colour, are terms incapable of application to mind.

Tyndall, however, ascribes to brain matter what philosophers ascribe to mind. He affirms the idea of self-determining as the attribute of a molecule. He says, "given the state of the brain, and the corresponding thought might be inferred. Or given the thought, and the state of the brain might be inferred."|| But he admits that this is all mere assumption when he says, "molecular groupings and molecular motions explain nothing."¶

Not One Entity.

May not mind and brain be one entity, with two aspects, a unity with two faces; or may not the one be the substratum, and the other the aspect of it?

* *Problems*, 430. † *Sheffield Address*.

‡ *Stewart's Diss.*, 112.

§ *North British Review*, vol. liii., p. 125.

¶ *Ibid.*, p. 141.

|| *Victoria Institute*, vol. vii., p. 137.

Our author says that "mental phenomena are the subjective aspect of the functions of sensory and motor substrata ; that they are reducible to correlation with the activity of certain simple motor and sensory elements ; that cerebral states include our volitions and emotions ; and that sensory centres are registers of sensations." Again, he speaks of "feelings and emotions with their physical substrata, and of the elementary substrata of mental phenomena."*

These, and other expressions in the paper, imply that the phusis and the psuche are different sides of one and the same substance ; or that the psuche is the aspect and the phusis the substratum.

Bain says, "the arguments for the two substances have lost their validity the one substance with two sets of properties, two sides, physical and mental appears to comply with all the exigencies of the case."†

Huxley says, "Matter and spirit are merely symbols by which we represent the forces which are supposed either to excite or bear up the thought. Matter must be reduced in thought to force ; and spirit is likewise force. So far they are identical."‡

Tyndall supposes that there is "but one substance, matter possessed of two sets of properties, of a physical and a spiritual side, making up a double-faced unity."§

According to Spencer, "body is to be regarded as a modification of mind, and mind as a modification of body, both being different modes of one single substance."||

We do not know how far our author goes with these writers ; but when he says "the cerebral cortex is the physical substratum, and the states of consciousness are the subjective aspect" ; ¶ that as "the cerebral cortex changes the consciousness changes correspondingly, the one being the substratum, the other the aspect of it," he appears to give up what dualists hold to be the key of their position ; and we do not think that, taking his stand where he does, on the relation of mind to brain, as aspect and substratum, or substratum and aspect, he could maintain the position of the dualist against the authors referred to.

But if the whole nerve organism be the elementary substrata of mental phenomena, and the mental phenomena be merely the subjective aspect of these substrata, and if we have a double-faced unity, having a physical and psychical side, every

* Pages 111, 112, 122, 123, 124.

† *Mind and Body*, p. 196.

‡ *North British Review*, p. 307.

§ Cook's *Lectures*, p. 83.

|| Gorman's *Psychology*, p. 165.

¶ Page 121

atom of which has a physical and psychical side, it follows that when one side, the physical substratum, is removed, the other side, the psychical aspect, goes with it; when an atom of the cerebral cortex goes, a corresponding portion of the state of consciousness goes with it. The Professor, however, tells us that, "one whole hemisphere of the brain may be destroyed, and yet the mental operations, the states of consciousness, remain complete";* the substratum may be removed, and the psychical aspect still remain. The cerebral cortex is not, therefore, the substratum of the mental aspect; for one half of the cortex may be destroyed, and the whole of the mental aspect remain. And mental phenomena are not the subjective aspect of the functions of sensory and motor substrata, for the substrata may be gone, and yet the mental phenomena remain complete. He cannot carry out his principle of substrata and aspects, and therefore it is a false principle.

It has been said that "the distinction † between mind and brain does not demand a corresponding opposition in their substance." But if different properties or attributes cannot co-inhere in the same substance, it follows that, as the properties of mind are different from those of brain, and cannot inhere in brain, and the properties of brain are different from those of mind, and cannot inhere in mind, mind and brain must be different substances. And, "as the phenomena ‡ or properties of brain are essentially different from those of mind, we are forced to conclude that brain and mind are two distinct substances; and that the mind is not material, nor the brain mental."

"To assert § that brain and mind are one entity, and that the opposite qualities of brain and mind co-inhere in one and the same substratum, is to assert that a thing can be, and not be, at the same time and in the same sense." It has been well said, that "the distinction between mind and matter stands like a reef in the tumbling seas of philosophy; and its roots take hold on the core of the world."

Mind, not Brain, thinks.

Professor Ferrier says, "cerebral || states include our volitions and emotions." But cerebral states are states of the material atoms of the brain, and volitions and emotions

* Page 106, "Functions of the Brain." Cook's *Lectures*, p. 78.

† G. H. Lewis, *Fortnightly Review*, vol. xix., p. 479.

‡ Hodge, vol. ii., p. 92. § Cook's *Lectures*, pp. 85, 23. || Page 112.

are mental states, states of the mind, not of the brain ; the former belonging to the phusis, and the latter to the psyche.

He tells us that "it is not merely the brain which thinks, but the brain in connection with the whole sensory and motor apparatus of the organism, and, therefore, our thoughts may thrill to the tips of our fingers."* It is not, however, the brain that thinks, but the man. "There is an energy behind the molecular movements, working by law, and guided by intelligence."

While our author says, "the brain in connection † with the whole sensory and motor apparatus of the organism thinks, and mental phenomena are the subjective aspect of the functions of sensory and motor substrata, and should be reducible to correlation with the activity of certain simple motor and sensory elements," others speak out more plainly on the subject.

Voght and Cabanis say that "the brain secretes thought as the liver secretes bile."‡ The liver secretes bile, as bile is material; but the brain does not secrete thought, as thought is spiritual. According to Baron d'Holbach, "thought § is the agitation of the nerves, and the result of corporeal organization." But the nerves are only matter, and their agitation cannot result in thought. Huxley says, "thought|| is as much a function of matter as motion is." "But motion and thought stand in very different relations to matter." Motion and change of matter are one thing, but thought and change of matter are two very different things.

All these writers make mind a product of brain, and ignore the distinction between atoms and mind. But that brain atoms should develop into thought is a notion which neither observation nor reason sanctions. Science, philosophy, and common sense are all against it.

Carpenter speaks of "the physical ¶ change being translated into the psychical," but adds, we know nothing about it. If he knows nothing about it, he should have said nothing about it, and not have affirmed an impossibility, the translation of matter into spirit; for, "between thought and the physical phenomena of matter there is no conceivable analogy."**

A Connection.

Brain organism and mind are two distinct and separate

* Page 112.

† Pages 111, 112.

‡ Cook's *Lectures*, p. 42; *British Quarterly*, vol. lxii., p. 117.

§ Hodge, vol. i., p. 254.

|| *British Quarterly*, vol. lix., p. 114.

¶ *Principles of Mental Physiology*, pp. 12, 13; Gorman's *Psychology*, p. 144.

** Allman's *Sheffield Address*.

substances,—the one, a material substance, consisting of elementary atoms ; the other a spiritual substance, consisting of feelings, thoughts, and emotions ; yet they stand in intimate and close connection with each other.

They are so connected that, when the functions of the material organism are interfered with, the phenomena of the mental factor are deranged. If the body or the mind, or both, be in a diseased state, there may be delusions.* But the connection between mind and brain is a mystery. The whole relations of the two are inconceivable to us. How they act and re-act on each other we cannot tell. The gap between them is wide, and the passage unthinkable.

Mind is not conscious of its dependence on material organs ; and is not enchain'd in any special organs. But as certain parts† of the nervous and cerebral centres are more connected with one set of sensations than another, so certain parts of the same centres may be more connected with one train of thought than another.

“The state of the viscera‡ has an influence on our psychical tone ; and, again, our feelings influence our organic functions.” But *mens sana* and *corpus sanum*, though desirable, are not “essentially correlatives,” as there is often a *mens sana* connected with a *corpus insanum*.

Though the functions of the brain organism are connected with the phenomena of mind, and a certain affection of the nervous system produces a certain affection of mind, yet philosophers maintain that mental events have nothing in common with the molecular movements of the nerve centre. They cannot be reduced into one another ; yet the stroke which paralyzes the brain may paralyze reason, memory, and will.

Sensation.

What do the brain and nervous system, as an organism, do for the mind ? Through the organs of *sense* they furnish the mind with those feelings called sensations.

“A sense is the capacity§ of the mind for a distinct class of sensations in connection with bodily organization” ; and a sensation is an affection of the mind arising from physical impressions on some one of these organs. But the transition from the impression on the organ of sense to the mental feeling is a mystery to which we have no key.

We have no sensations which do not come to us through

* Page 124.

† Page 123.

‡ Page 121.

§ Cairns's *Logic*, p. 9.

these five organs of sense. And the brain and nerve organism give us nothing but sensations. We can have no sensations, or feelings, which come in by the organs of sense, unless we have the organs. Nor can we form any idea of these sensations, or feelings, unless we have the organs.

When the organs of sense are acted on *ab extra* they give us sensations, which are feelings, or mental states. More than this they cannot give us. And how the feeling arises in connection with the impression on the nerves of the different organs is a mystery, and likely to remain so.

While the brain and nerve organism, through the organs of sense, furnish the mind with sensations only, their sound condition and healthy exercise are largely necessary to the functions of the faculties of the mind.

Idea.

"An idea, or notion, is simply a feeling involving a reference to some other thing."* "And sensations neither become nor produce ideas of any kind; but merely present occasions for the exercise of other mental principles, by which the various ideas are formed."

The paper, however, seems to say that ideas, as well as sensations, come in by the brain as the organ of mind; for it speaks of "sensory and motor ideation, of auditory ideation, and of the revival of sensation in idea,"† and adds, "the revival of a sensation in idea must possess essentially the same quality." Ideation, however, is neither sensory, motor, nor auditory, but mental.

A sensation cannot be revived in idea; but, if you place yourself in circumstances exactly similar, you may have a sensation exactly similar to the former one. And the idea of a sensation does not possess essentially the same quality, and "produce the same corporeal manifestations," as were caused by the sensation itself.

Again, the paper speaks of "the centres of sensory and motor ideation."‡ Ideation, however, belongs to mind: sensory and motor belong to brain and nerve matter. The one belongs to the psuche, the other to the phusis; and, therefore, we cannot speak of sensory and motor ideation without confounding mind with brain matter.

Again, it speaks of "auditory ideation,"§ and on the same page of auditory sensation. The one phrase is correct, the other not. The auditory sense furnishes us with auditory

* Cairns's *Logic*, p. 10. † Pages 122, 123. ‡ *Ibid.* § Page 119.

sensation, not auditory ideation. All our senses together do not give us ideation. The paper, however, admits that idea belongs to the mind, not to the organs of sense, when it says, "an idea in the mind, which we desire to retain, is kept there by the restraining influence which, through those higher centres, we can exert upon the other centres."*

Consciousness.

The Professor uses the term "consciousness" in a manner tending to give us an incorrect view of brain as the organ of mind. He speaks of "attentive† ideation by which consciousness is kept concentrated on certain phenomena," where he uses "consciousness" instead of "mind," for attention is just the mind concentrated on certain phenomena. And he speaks of "the brain as the organ of consciousness," where he uses "consciousness" instead of "sensation." This, however, is not to be wondered at, as, on the same page, he uses the phrase "sensation or consciousness," making sensation and consciousness synonymous.

"Consciousness‡ is applied to every state of mind to represent it during its continuance, merely as a feeling. It denotes the mind's capability of knowing each of its states; and it refers exclusively to what is in the mind itself."

The paper speaks of "our states of consciousness, actual and potential, in the cerebral cortex"; but our states of consciousness are states of mind, and in the mind, not states of matter, and in the cerebral cortex. It also speaks of "continuous§ registration of our conscious experience in the cerebral cortex;" but conscious experience, or consciousness, is mental, and cannot be registered in the cortex. It also says, "impressions|| on sensory nerves do not affect consciousness merely as facts, but have certain qualities which express themselves subjectively as feelings." Impressions on the sensory nerves, however, give us sensations and nothing else.

It has been said that, "some¶ change in the condition of the matter of the brain is the invariable antecedent of each sensation, thought, and emotion," and our author says, "all consciousness** implies cerebral activity"; and Allman says, "when†† a thought passes through the mind it is associated

* Page 123.

† Pages 113, 122.

‡ Cairns's *Logic*, p. 8.

§ Page 124.

|| Page 121.

¶ Huxley, *Fortnightly Review*, vol. xvi., p. 557.

** Page 113.

†† Sheffield Address.

with some change in the protoplasm of the cerebral cells." But all this is a mere assumption. Consciousness is not the result of a number of concomitant movements in the material frame, but a state of mind.

Our author says, "mental phenomena* are reducible to correlation with the activity of certain simple motor and sensory elements." This almost reduces mental phenomena to motion, and comes nearly up to Spencer's view that "thought is nothing more than converted heat," or a mode of motion. But this, again, is all mere assumption, for "there is nothing† more ridiculous than to imagine that any modification of matter should produce thought."

Allman says, "consciousness is never manifested except in the presence of cerebral matter, or of something like it."‡ In the name of philosophy, as well as science, we ask the President of the British Association what he means by the something like it. He says, again, "now we may indicate some point which would refer consciousness, as well as life, to a common material source."§ But materialism can indicate no point which refers consciousness and life to a material source. Consciousness always comes from consciousness, and life from life.

Dr. Pye Smith says, "the physiology|| of the nervous system has thrown more light upon the phenomena of consciousness than was gained by the acutest minds of all ages without the help of anatomical methods." But this is what Goldsmith calls "*a bounce*"; for, to discover consciousness, which is a mental state, among the bones and muscles, the nerves and sinews, of the human frame, by the help of the scalpel of the anatomist, would be a feat indeed.

Memory.

Our author writes very erroneously on the subject of memory. He confounds perception with memory when he says, "It is necessary¶ for perception that there should be a registration of sensory experiences, by which alone it is possible for present impressions to be compared with former ones." He says "the organic** modifications of the cells are the basis of memory and ideation, and the foundation of all knowledge and thought." But memory, ideation, knowledge, and thought are all mental, not material,—are in the mind, not in the cells of the brain.

* Page 111. † Gorman's *Psychology*, p. 179. ‡ Sheffield Address.
§ *Ibid.* || *Ibid.* ¶ Page 114. ** *Ibid.*

He speaks of "the sensory* elements of ideation stored up in centres"; but the centres are only numbers of atoms, and atoms cannot contain ideas. The one cannot be stored up in the other, as the one is mental and the other material. He says "the sensory centres are the seat of sensation, sensory memory, and ideation."† But memory and ideation are mental states, have their seat in the mind, and not in nerve centres.

Again, he says that the "motor‡ centres are the origin of motor stimulation, and the organic basis of motor memory and motor ideation"; that "the motor centres are distinct from those which perceive and register sensations"; that "the sensory centres§ are registers of sensations in which they are stored up and capable of re-presentation in connection with their respective associations." But the acts of perceiving and registering are acts of the mind, and not of numbers of material atoms; and sensations are mental states, which can neither be re-presented nor stored up in bundles of atoms. He also speaks of "the motor memory|| and ideation of the right hand," but memory and ideation belong to the mind, and not to the hands, whether right or left.

He says, it is "through¶ the brain that we live subjectively, both in the past and present." It is, however, rather through memory that we live subjectively in the past, and through consciousness that we live in the present. Both of these belong to mind, and, therefore, it would be more correct to say, it is through the mind that we live subjectively. Moreover, it has been said that life is manifested primarily in the heart, not the brain; and it is as much through the blood, passing through the heart, that we live, as through the brain.

The atoms of the brain are continually changing, and, therefore, form a poor basis for memory. But "there is something** imperishable in memory, which is inexplicable on the supposition that the mental faculty is a mere function of any perishable organ like the brain,—something which appears to necessitate the conclusion that the mind, of which memory is a faculty, has its foundation deep down in spirit."

The paper says, "We retain an idea in the mind by the restraining influence which, through these higher centres, we can exert upon the other centres through which it may tend to diffuse itself."†† Think of the Professor saying to a student, "Keep that idea in your mind." The student asks, "How shall I do so?" The Professor replies, "By the

* Page 115.

† Page 116.

‡ *Ibid.*

§ Page 129.

|| Page 119.

¶ Page 124.

** *Contemporary Review*, vol. xxv., p. 134.

†† Page 123.

restraining influence which, through the higher centres, we can exert upon the other centres through which it may tend to diffuse itself"; and to help the student to do so the Professor might add, "The frontal lobes are the substrata of these controlling influences." We would say to the student, "Keep the idea in your mind by attending to it."

Personal Identity

is the property of every person. It is witnessed to by consciousness, and no other proof is needed than our own consciousness.

The paper is very erroneous on the subject of personal identity. It tells us that "the sum* of all our states of consciousness constitutes our personality,—our Ego; that these states of consciousness are in the cerebral cortex, which is continually undergoing novel combinations; that the cerebral cortex is the physical substratum, and the states of consciousness are the subjective aspect; that as the cerebral cortex changes, so the states of consciousness change accordingly, the one being the substratum, the other the aspect of it; and that therefore it is incorrect to say that our personality retains its identity."

Such is our author's own conclusion, drawn fairly from his own premises, laid down and reasoned out in his paper. But the conclusion which denies personal identity must be a false conclusion, and therefore the premises from which the conclusion is drawn must be false premises. The argument which requires us to give up our personal identity is a false argument. But the argument of our paper that our states of consciousness are in the cerebral cortex requires us to give up our personal identity, and therefore it is a false argument.

Our author makes personality equivalent to cerebral manifestation when he uses the phrase "personality, or cerebral manifestation." † Personality, however, does not consist in the sameness of the cerebral cortex or other parts of the brain, but in the sameness of the Ego; and consciousness tells us that the Ego is one, not many.

He tells us our consciousness of personality "is possible only through the continuous registration of our conscious experience in the cerebral cortex." ‡ But this registration is mere assumption, of which we have no proof; and even if such

* Page 124.

† *Ibid.*

‡ *Ibid.*

registration were effected, it could not give us identity, as the cerebral cortex is momentarily passing away.

The Professor admits that "it is incorrect to say that our personality retains its identity,"* and says that "our personality changes every moment." He thus abandons personal identity. It also follows from his reasonings that when the registration in the cortex ceases, the personality ceases; and, as a matter of course, when the personality ceases, the person, the Ego, also ceases; and thus we reach the terminus of all materialism.

The CHAIRMAN, having conveyed a vote of thanks to Dr. Fisher for his very careful paper, called upon the Honorary Secretary to read some communications referring to the paper.

The Honorary Secretary then read the following which had been received from Mr. F. BATEMAN, M.D., of Norwich :—

"The subject introduced by Dr. Fisher is one especially calculated to interest the members of the Victoria Institute, treating, as it does, of the mysterious connection between matter and mind. It is especially interesting at this juncture, when, as you are aware, there is a certain school of modern philosophers who are trying to materialise everything, ignoring man's spiritual and metaphysical attributes, the belief in which, they regard as a relic of mediæval superstition. They go so far as to assert that mind, thought, and consciousness, are bodily functions, and simply the result of some molecular or atomic change in the brain. However, evidence is daily accumulating of a scientific character, which directly tends to controvert the materialistic tendencies of the day, and to show that what has been termed the 'slippery force of thought—the *vis vivida anima*'—cannot be weighed in the balance.

"If I understand the author right, he contends for the *Immateriality* of Mind. I agree with him, but I think he has failed to state his case as clearly and as forcibly as he might have done. In speaking of Dr. Ferrier's definition of the 'brain as the organ of mind,' Dr. Fisher complains that we are not told 'what Dr. Ferrier wishes us to understand by *organ*, *brain*, or *mind*.'

"Now, this is not the time or place to enter minutely into this question, a subject which I have treated at some length in my work on 'Darwinism tested by Language'; † I wish, however, to say that I so far agree with Dr. Ferrier, that the brain is undoubtedly the *material* organ of mind, and that by it our thoughts become manifested to the outer world, for each of our faculties manifests itself by means of matter, and the material condition which renders the exercise of a faculty possible is an organ; but it is important *not* to confound the faculty itself with the corporeal organ upon which the *external* manifestation of this faculty depends.

"I would illustrate my meaning by an allusion to the electric telegraph, an apparatus by which ideas and words are transmitted from mind to mind, with a rapidity to which ordinary language cannot attain. Now, the electrical battery may be not inaptly compared to the brain, and the telegraph

* Page 124.

† Dr. Bateman's paper on this subject will be found in vol. vii., p. 73.

wires to the nerves which emanate from the cerebral organ to supply the various structures engaged in articulate language. If the 'battery' be out of order, or the telegraph wires be broken, this 'lightning language,' by which mind speaks to mind, becomes impossible. Precisely in the same way, a certain normal and healthy state of cerebral tissue is necessary for the *exterior* manifestation of our mental faculties, but this is a very different thing from saying that the cerebral organ is the '*Seat of the Mind*,' and that the brain secretes thought, just as the liver secretes bile, whereas it is simply the material organ by which our intellectual faculties become *externally manifested.*'

Also the following from Mr. C. B. RADCLIFFE, M.D. :—

"The paper is not all that I could have desired; the purely physiological part of Dr. Ferrier's work is the part which I think alone demands attention, and this part is not touched upon. I greatly wish the paper had been a criticism of the opinion of men like Bain and Herbert Spencer. Dr. Ferrier simply follows men like these at a humble distance when he talks about mind, and he has not a word to say for himself which is in any sense original. He believes, as do his masters, that mind is a function of brain and other nerve-centres. Dr. Ferrier is an accurate and painstaking experimentalist, and highly deserving of praise on this account. He is, in my opinion, very one-sided. He may be right in the main in what he attempts to prove—that there are *centres* in the cortex of the brain which rule the movements of the tongue in speaking, of the hand in handling, and so on; but I am disposed to agree rather with Drs. Brown-Séquard, Dupuy, and others, and think that many of his experiments are fallacious. But whether he is right or wrong does not matter. He has no fact which gives additional support to the notion that mind and live brain are convertible terms, and those who believe in the spontaneity of mind, have nothing to fear in what he says and does. To deal with Dr. Ferrier on his own special grounds would require a long paper and many diagrams."

The discussion, which was of a general character, was taken part in by Admiral Fishbourne, C.B., R.N., Mr. J. Enmore Jones, Mr. L. Dibdin, the Rev. J. W. Buckley, and Admiral Nolloth, C.B., R.N. The author having replied,

The meeting was then adjourned.

Since the meeting the following additional communications have been received :—

Dr. ALEXANDER HARVEY, Emeritus Professor of *Materia Medica* in the University of Aberdeen, writes as follows to Dr. Fisher :—

"I have read your criticism with great satisfaction, and I may say that I agree with you in all, or almost all, you say."

Mr. J. M. WINN, M.D., writes :—

"It may be some satisfaction to those members of the Victoria Institute who have not sufficient leisure to study the physiological aspect of Dr. Ferrier's researches, and who may fear that his experiments will tend to shake the general belief in the independence of the human mind,—it may, I say, be a relief to such persons to be assured that Dr. Ferrier has utterly failed to establish the phrenological doctrine, that the faculties of the mind can be localized in the brain.

"In January, 1877, when I had the honour to deliver an address before a meeting of members of the Victoria Institute, on '*Materialistic Physiology*', I, for the second time, challenged the neurologists to show that any

one really great fact had been elicited since the discoveries of Sir Charles Bell and Marshall Hall. The nerve-fibres of sensation and motion have been traced further towards the circumference of the brain, but we are as ignorant as ever of the properties of the caudate nerve-cells of the cerebral convolutions; we can only surmise that it is through them that sensations are perceived and volition exercised. As yet, I have received no answer to my challenge.

"The centres of motion and sensation are far from being accurately determined; what right then have Dr. Ferrier and other physiological psychologists to assume that they can locate the higher faculties of the mind in the grey cortex of the brain. A scientific worker like Dr. Ferrier may make a thousand experiments without having the good fortune to hit on a valuable discovery; we cannot, therefore, place him in the same rank with those who have been able to establish a great and general principle.

"I am happy to have this opportunity of congratulating Dr. Fisher on the skill and boldness with which he has insisted on the line of demarcation existing between brain and mind, which remains as distinct as it was in the days of Plato."

Mr. J. FOSTER PALMER, L.R.C.P., writes:—

"Dr. Fisher's view appears to be that because Professor Ferrier is a physiologist, therefore, he does not understand the rules of logic, and because he does not understand the rules of logic he is not competent to write on mental philosophy. It may be necessary for those whose sole object in writing is to impress on others their own views, to hedge their statements well round with logical arguments, but the physiologist proceeds on an entirely different plan. He sets forth the results to which his own observations lead him, in plain language, leaving others to judge for themselves,—confirming his statements if they find them true, and refuting them if they are based on errors of observation. It has been truly said by Reid that no mental philosopher can delineate anything except the condition of his own mind. It is only by comparing the observations of a very large number of unprejudiced observers that any general result can be arrived at.

"I have a few words to say on Dr. Fisher's definition of the word 'organ.' 'Organ is an instrument constructed by man for some definite purpose, and requires man to act upon it.' The facts in the case are particularly unfortunate in not agreeing with this definition, *e.g.*, the organs of sense are certainly not made by man, and they are not acted upon by man, but by the external stimuli (waves of light, sound, &c.), nor can any organ of the body, strictly speaking, be acted upon by that of which it forms a part. An organ may with more propriety be considered a medium of communication by means of which some operation is performed. But if Dr. Ferrier has made an arbitrary division in calling the brain the organ of the mind, Dr. Fisher has done the same to a greater degree in including with the brain the entire nervous system to the extremities of the nerve-fibres, and at the same time excluding the organs of sense, or such portions of them as remain after the removal of the nerves. The terminal fibres of the optic nerve, for example, constitute the retina, which forms the entire fundus of the eye. If the retina and ciliary nerves were taken away there would remain nothing but a series of lenses, which could no more be called an organ of sense than could a pair of spectacles. Either the organs of sense must be included with the brain and nervous system as the *organ* which connects the mind with the external world, or the portions of the nervous system must be differentiated. In this case it would be the centres of ideation, or, in more general terms, the grey matter, of the brain which is the actual connecting medium, or organ, between the mind and the nerve-fibres."

ORDINARY MEETING, MAY 10, 1880.

H. CADMAN JONES, Esq., M.A., IN THE CHAIR.

The minutes of the last meeting were read and confirmed, and the presentation of the following works for the library were announced :—

“Proceedings of the Royal Society.” *From the same.*
A Pamphlet. By Dr. J. M. Winn. *Ditto.*

The following paper was then read by the Author :—

EVOLUTION AND MORAL SCIENCE, BEING OBSERVATIONS ON MR. HERBERT SPENCER'S DATA OF ETHICS. By the Rev. HENRY WACE, M.A., Chaplain of Lincoln's Inn, Professor of Ecclesiastical History in King's College, London.

1. **M**ANY persons will have welcomed with great interest Mr. Herbert Spencer's recent work on *The Data of Ethics*. He is the recognised exponent of a principle which has of late been asserting a claim to be paramount in all domains of human thought and life. He has projected a comprehensive system of philosophy embracing the whole sphere of existence—inanimate, animate and human—founded upon the hypothesis of Evolution. It was affirmed the other day by Professor Huxley that this hypothesis must now be regarded as conclusively established, and though this opinion is certainly not universal among men of science, there is no doubt that Evolution is the favourite scientific creed of the day. If Mr. Darwin is its chief author, Mr. Spencer may be said to be its chief prophet. He has proclaimed it as the main key to the philosophical and social problems by which mankind have been perplexed, and he does not stop short of putting it forward as the substitute for the religious creed by which our

life has hitherto been moulded. It is to supply us with all the guidance we need, and is in many ways to transform our present views of our duties and capacities. Mr. Herbert Spencer's qualifications for this task do not seem disputed by those who deem it a practicable one. On all hands, indeed, his ability alike in thought and in expression is acknowledged, and we may therefore safely trust his exposition of the bearings of the new philosophy upon the subjects he discusses. Now, so long as the Evolution hypothesis is applied solely within the realm of nature, many of us would be content to leave its value to be discussed by men of science like Professor Huxley. Though the arguments ostensibly adduced in its favour may not seem to us conclusive, we should not feel ourselves competent to intrude into a field where so much special knowledge is required. But when the Evolution philosophy leaves this region and enters a domain like that of Ethics, in which it "comes home to men's business and bosoms," we may assert some competence to judge of its claims, and it becomes a duty to attempt to do so. Ethics include the most important of all questions in human affairs. They affect the simplest matters of daily life on the one hand, and the most momentous questions of religion on the other. They at once supply the foundation and determine the superstructure of human action; and when the exponent of a popular school of philosophy proposes to treat them from an entirely new point of view, we cannot but listen with attention. The subject is one which men of general education are qualified to discuss, and which requires the exercise of the reasoning and reflecting powers rather than special and technical knowledge.

2. In this estimate of the import of the present publication we are following Mr. Herbert Spencer himself. He explains in his preface that it constitutes the first division of the work on the principles of morality, with which his system ends; and he has somewhat deviated from the order he had prescribed for himself in publishing it before some other parts of the system are completed. But he was afraid lest, if he adhered strictly to that order, his health might fail before he reached the last part of his task; and "this last part of the task it is," he says, "to which I regard all the preceding parts as subsidiary." For nearly forty years, his "ultimate purpose, lying behind all proximate purposes, has been that of finding for the principles of right and wrong in conduct at large a scientific basis." To leave this purpose unfulfilled would be a failure of which he did not like to contemplate the probability; and in the present work he

has endeavoured to preclude it, "if not wholly, still partially." Though this division of the work cannot, of course, contain the specific conclusions to be set forth in the entire work, "yet it implies them in such wise that definitely to formulate them requires nothing beyond logical deduction." He adds that he was the more anxious to provide this outline of his final work because he considers that "the establishment of rules of right conduct on a scientific basis is a pressing need. Now that moral injunctions are losing the authority given by their supposed sacred origin, the secularization of morals is becoming imperative. Few things can happen more disastrous than the decay and death of a regulative system no longer fit, before another and fitter regulative system has grown up to replace it." There is a "vacuum" left by "disappearance of the code of supernatural ethics," and in his opinion, "those who believe that it can be filled, and that it must be filled, are called on to do something in pursuance of their belief."

3. These, it may justly be said, are the highest pretensions which a philosopher could well put forward. The "code of supernatural ethics" which Mr. Spencer deems obsolete has been for many centuries the predominant force in the life of the most civilized portions of mankind. It has laid a strong grasp upon the whole of human conduct; it has inspired men in life and has supported them in death. To propose to fill "the vacuum" which would be occasioned by the disappearance of this creed is much more than to offer a new theory on the subject of moral philosophy. It involves little less than founding a new religion. It is an attempt, in Mr. Spencer's own words, to provide for "right and wrong," and therefore for all moral conduct, a new "basis," and that a scientific one. Nor is this his only reason. He is persuaded that the prevalent system of morality is false in tone and injurious in its influence. "Great mischief has been done by the repellent aspect habitually given to moral rule by its expositors; and immense benefits are to be anticipated from presenting moral rule under that attractive aspect which it has when undistorted by superstition and asceticism." "Nor does mischief result only from this undue severity of the ethical doctrine bequeathed us by the harsh past. Further mischief results from the impracticability of its ideal." It upholds a standard of abnegation beyond human achievement, and "the effect is to produce a despairing abandonment of all attempts at a higher life." These observations will seem to many persons to offer a strangely perverted account of a Gospel which promises blessings to all who accept it, and to betray a singular blindness to those "attempts at a higher life" which that

Gospel still stimulates. But our present concern is simply to observe the immense pretensions thus put forward. Mr. Spencer proposes to supersede a Revelation and to regenerate morality. It would hardly be practicable, within the space of a paper to be read before this Society, to offer a complete examination of so comprehensive an attempt; but it will probably not be found difficult to come to a general conclusion as to its value.

4. It need not be said of any work of Mr. Spencer that it contains many interesting discussions, and that the illustrations drawn from his wide knowledge of natural philosophy frequently place the facts of life in a striking light. On the other hand, it is necessary to say that the book contains examples of inaccurate statements and fallacious argumentation which are extremely surprising in a writer of Mr. Spencer's reputation, and which must raise a strong presumption against the trustworthiness of his conclusions on such a subject. Take, for instance, his criticism of Aristotle's view of the relation of virtue to happiness, on pp. 34-37. He is speaking of moralists "who think that the idea of virtue is not resolvable into simpler ideas." "This," he says, "is the doctrine which appears to have been entertained by Aristotle. I say, appears to have been, because his statements are far from consistent with one another. Recognising happiness as the supreme end of human endeavour, it would at first sight seem that he cannot be taken as typical of those who make virtue the supreme end. Yet he puts himself in this category by seeking to define happiness in terms of virtue, instead of defining virtue in terms of happiness." The fallacy of this objection is concealed by the vagueness of its expression. What does Mr. Spencer mean by defining one thing in terms of another? Definition consists in assigning an idea to the class to which it belongs, and specifying the difference which distinguishes it from other ideas of the same class. If, then, Aristotle had said that happiness was a kind of virtue, he would no doubt have treated virtue as a more general idea than happiness. But this is what he does not do. He defines happiness to be "an energy of the soul in accordance with virtue."* He describes virtue, in other words, as conducive to happiness, not happiness as conducive to virtue.

5. But Mr. Spencer proceeds to show a complete disregard of Aristotle's conceptions on this point. Those, he says (p. 36), which Aristotle calls virtues, "must be so called

* ινέργεια ψυχῆς κατ' ἀρετὴν ἀριστην οὐ βίω τελεῖφ.—*Eth. Nic.*, i. 5.

in consequence of some common character that is either intrinsic or extrinsic. Are the virtues classed as such because of some intrinsic community of nature? Then there must be identifiable a common trait in all the cardinal virtues which Aristotle specifies — Courage, Temperance, Liberality, Magnanimity, Meekness, Amiability or Friendliness, Truthfulness, Justice. What, now, is the trait possessed in common by Magnificence and Meekness? and if any such trait can be disentangled, is it that which constitutes the essential trait in Truthfulness? The answer must be—No." Now, it would be perfectly competent to Mr. Spencer to maintain that this is the true answer; but it is extraordinary he should make no reference whatever to the fact that it is an essential part of Aristotle's argument to specify not merely a common trait, but a common definition in all these virtues. Aristotle's discussion of the nature of virtue is one of the most important and elaborate portions of his work, and he defines virtue to be a moral habit subsisting in a mean relative to ourselves, which is determined by sound reason. Thus magnificence is the habit which constitutes the true mean in the expenditure of money, between vulgar profusion on the one side and meanness on the other. Meekness is the mean in reference to the indulgence of anger between undue passion and indifference. Moralists have differed in their opinions respecting the adequacy of this definition of virtue. But it is one of the most memorable contributions to moral science, and if Aristotle's opinion was to be discussed, it ought not, at all events, to have been ignored. The judgment of so acute an observer deserves at least some respect on a subject in regard to which he stands in the very first rank of thinkers; and it is perfectly certain that he did class the virtues together because he considered them to be marked by "an intrinsic community of character." That which is to be complained of is not that Mr. Spencer differs from Aristotle. If he could supersede him, so much the better. But we have a right to expect that in treating such a subject, for such a purpose, he would at least attend to what Aristotle says, instead of partly ignoring and partly misrepresenting it.

6. It seemed desirable to draw attention at the outset to this instance of inaccurate statement and argument, because it is intimately connected with one remarkable instance of fallacious reasoning on which, in great measure, the whole of Mr. Spencer's argument turns. One of the first questions with which a moralist has to deal is the meaning of the distinction between good and bad, right and wrong; and Mr. Spencer's third chapter discusses "good and bad conduct." He con-

siders the manner in which the words good and bad are generally applied, and deduces from this general use their meaning as applied to good conduct. He observes that we apply them "according as the adjustments of acts to ends are, or are not, efficient." "The conduct which achieves each kind of end is regarded as relatively good, and is regarded as relatively bad if it fails to achieve it" (p. 22). Accordingly, human conduct is spoken of as right or wrong according as it promotes one of three general ends—the welfare of a man's self, that of his offspring, and that of his fellow-citizens. We do not ordinarily, indeed, Mr. Spencer observes, emphasize the ethical judgments we pass on self-regarding acts—a fact which he explains by the consideration that the self-regarding desires are generally strong enough and do not need moral enforcement. But when we turn to the rearing of offspring, a mother is termed good "who, ministering to all the physical needs of her children, also adjusts her behaviour in ways conducive to their mental health;" and similarly with the father. But "most emphatic are the applications of the words good and bad to conduct throughout that third division of it comprising the deeds by which men affect one another. In maintaining their own lives and fostering their offspring, men's adjustments of acts to ends are so apt to hinder the kindred adjustments of other men, that insistence on the needful limitations has to be perpetual; and the mischiefs caused by men's interferences with each other's life-subserving actions are so great that the interdicts have to be peremptory. Hence the fact that the words good and bad have come to be specially associated with acts which further the complete living of others, and acts which obstruct their complete living. Goodness, standing by itself, suggests, above all other things, the conduct of one who aids the sick in re-acquiring normal vitality, assists the unfortunate to recover the means of maintaining themselves, defends those who are threatened with harm in person, property, or reputation, and aids whatever promises to improve the living of all his fellows. Contrariwise, badness brings to mind, as its leading correlative, the conduct of one who, in carrying on his own life, damages the lives of others, by injuring their bodies, destroying their possessions, defrauding them, calumniating them" (p. 24).

7. It will be necessary to return to this passage; but for the purpose of observing the fallacy more particularly in view, let us pass on to the deductions Mr. Spencer draws from these observations. He has argued in a previous chapter that evolution reaches its highest stage when conduct "simul-

taneously achieves the greatest totality of life in self, in offspring, and in fellow men" (p. 26); and this, in accordance with the illustrations just given, he concludes to be good conduct. He next observes that this judgment upon conduct involves an affirmative answer to the question, Is life worth living? "On the answer to this question," he says, "depends entirely every decision on the goodness and badness of conduct" (p. 26). Of course, this is only true on the assumption just made, that conduct is good or bad according as it increases or diminishes the sum total of life. But allowing this to pass for the moment, let us follow Mr. Spencer further. He proceeds to inquire on what ground the question of the desirableness of promoting life is practically determined; and he concludes that all arguments on the subject "assume it to be self-evident that life is good or bad, according as it does, or does not, bring a surplus of agreeable feeling." That which is implied in all views "is, that conduct should conduce to preservation of the individual, of the family, and of society, only supposing that life brings more happiness than misery. Changing the venue cannot alter the verdict. If either the pessimist, while saying that the pains of life predominate, or the optimist, while saying that the pleasures predominate, urge that the pains borne here are to be compensated by pleasures received hereafter, and that so life, whether or not justified in its immediate results, is justified in its ultimate results, the implication remains the same. The decision is still reached by balancing pleasures against pains. . . . Thus there is no escape from the admission that in calling good the conduct which subserves life, and bad the conduct which hinders or destroys it, and in so implying that life is a blessing and not a curse, we are inevitably asserting that conduct is good or bad according as its total effects are pleasurable or painful" (p. 28). "One theory only," he affirms, "is imaginable, in pursuance of which other interpretations of good and bad can be given. This theory is that men were created with the intention that they should be sources of misery to themselves; and that they are bound to continue living that their Creator may have the satisfaction of contemplating their misery" (p. 28). Omitting people of this class "as beyond or beneath argument," Mr. Spencer finds that all others avowedly or tacitly hold that the final justification for maintaining life can only be the reception from it of a surplus of pleasurable feeling over painful feeling; and that goodness or badness can be ascribed to acts which subserve life or hinder life only on this supposition. He concludes, therefore, that "if we call good every kind of conduct which aids the lives of others, and do this under the belief

that life brings more happiness than misery ; then it becomes undeniable that, taking into account immediate and remote effects on all persons, the good is universally the pleasurable."

8. Now, here we reach that strange fallacy in reasoning which has been referred to as underlying the whole argument. It is evident that if this statement be intended as a definition of moral goodness, it is vague and incomplete in the extreme. It is certainly not every kind of pleasure that is morally good. That only is morally good which involves particular kinds of pleasure, or a particular subordination of pleasures. Although there is some carelessness, from which Mr. Spencer might again have been preserved by Aristotle, in using the words pleasure and happiness as if they were synonymous, it was scarcely necessary, perhaps, to expend so much argument in order to prove that moral goodness leads to blessedness, and that we cannot conceive righteousness ultimately disjoined from happiness. The good belongs to the class of pleasurable things. But what are we to think of a reasoner who concludes from this, as if it were self-evident, that pleasureableness is the one universal test of goodness, and constitutes, in fact, either its definition or its distinguishing property ? It is an offence against one of the most elementary rules of logic. Man is an animal, to quote an old logical example ; but no one, probably, ever yet concluded from this that we call an individual a man on account of his possessing an animal nature. Yet this is similar to Mr. Spencer's argument ; and he proceeds to reiterate it in the most confident and positive form. He asserts that "the moralist who thinks this conduct intrinsically good, and that intrinsically bad, if pushed home, has no choice but to fall back on their pleasure-giving and pain-giving effects. *To prove this it needs but to observe how impossible it would be to think of them as we do if their effects were reversed.* Suppose that gashes and bruises caused agreeable sensations and brought in their train increased power of doing work and receiving enjoyment, should we regard assault in the same manner as at present ? Or, again, suppose that picking a man's pocket excited in him joyful emotions by brightening his prospects, would theft be counted among crimes as in existing law-books and moral codes ? *In these extreme cases, no one can deny that what some call the badness of actions is ascribed to them solely for the reason that they entail pain, immediate or remote, and would not be so ascribed did they entail pleasure*" (p. 31). In Mr. Spencer's phrase, it should rather be said that "no one can deny" that there is absolutely no consecution in this argument. Without reference to the validity of the conclusion,

the apparent reasoning by which it is reached is a mere sophism. The fact alleged is that we should not consider an act bad unless it entailed pain. It certainly does not follow that we call it bad "solely for the reason that it entails pain." Because a certain result is the property of an action, it does not follow that it is its only property; nor even that it is its principal property. Even if it be allowed that the pain resulting from evil actions is one reason why we call them bad, there is an extreme recklessness of assumption in jumping to the conclusion that this is the only reason. Mr. Spencer cannot consistently contend that there are no characteristic qualities in morally good actions except that they tend to pleasure. He himself, as we shall subsequently have occasion to observe, recognises that justice is a valuable practical test of actions (p. 164). If so, it follows that badness may be confidently ascribed to an action because it is unjust. It must be observed, however, that Mr. Spencer leaves himself no escape from this fallacy. He goes on to say, that, "using as our tests these most pronounced forms of good and bad conduct, we find it unquestionable that our ideas of their goodness and badness really originate from our consciousness of the certainty or probability that they will produce pleasures or pains somewhere." Giving the utmost latitude to his argument, what does it prove about the origination of these ideas? He maintains by a very elaborate method that goodness must lead to pleasure somewhere and somehow. "Pleasure somewhere, at some time, to some being or beings, is an inexpugnable element of the conception." Granting that this may be ultimately involved in the conception, it is a very different thing to assume that it was its origin, and its sole origin. Even, in a word, if the conclusion were right the premises would not carry it. If such a piece of reasoning on such a subject were encountered in a writer of less reputation than Mr. Herbert Spencer, we should be justified in at once laying down the volume. On questions which deal with the complex and delicate organization of the highest part of human nature, accurate statement and strictly logical reasoning are more than usually requisite; and if we find these qualifications disregarded at the very threshold of the subject, we may well lose all confidence in the sequel.

9. The point Mr. Spencer has omitted to notice is indicated by a hasty observation of his own in the passage, already noticed, which refers to Aristotle. "If," he says, "virtue is primordial and independent, no reason can be given why there should be any correspondence between virtuous conduct and conduct that is pleasure-giving in its total effects on self, or others, or both; and if there is not any necessary corre-

spondence, it is conceivable that the conduct classed as virtuous should be pain-giving in its total effects" (p. 37). It would seem peculiarly strange that such a remark should be made by an evolutionist. One of the most interesting features in Mr. Spencer's book is his description of the manner in which, as life becomes more and more developed, the different functions of our nature, physical, biological, psychological, and sociological, each attain their best development. As he expresses it, the "physiological rhythms" become more regular as well as more various in their kinds as organization advances. Activities are fulfilled "in the spontaneous exercise of duly-proportioned faculties." If this be the case, and the implications of the theory of evolution lead Mr. Spencer to lay great stress on it, the perfection of the individual faculties, their harmonious and pleasurable exertion, is necessarily in correspondence with the final result attained in the complete development of the whole social system. In fact, though he ignores it, he sometimes approaches closely to Aristotle's statement, that happiness is an energy in accordance with the most perfect action of our faculties. If, therefore, in any case, it be immediately discernible what is the right action of a given faculty, we may know, without going any further, that this is conducive to the ultimate happiness of mankind. To take an obvious example: it is a matter wholly independent of theories respecting the universe, of religion or of evolution hypotheses, that the virtue of one part of the intellect is to argue according to the rules of the syllogism, and to calculate in accordance with the multiplication table. If then a man maintains that twice two are five, or if Mr. Spencer mistakes a logical *Genus* for a property, can we allow that we have no reason to call the respective procedures bad except that they have painful consequences? They are wrong in themselves. There is something "primordial and independent" in the badness of a false syllogism; and the reason to be given for the ultimate correspondence between good reasoning and good conduct is, that, according to Mr. Spencer's own hypothesis, all things are indissolubly bound up together; so that an error in one entails an error in all. Now, if we are thus capable of detecting an intellectual error, without reference to its ultimate consequences, why not a moral error? If we are capable of detecting a false argument, in itself and as it stands, why should we not be capable of similarly detecting a wrong act in morals? In a word, if nature be one, there is evident reason why all parts of it should be in harmony, and why a defect in a part should necessarily entail defect in the whole.

10. Mr. Spencer's argument appears, in short, vitiated from

the outset by the fatal error of incomplete observation. He has specified a large class of cases in which the words good and bad are applied to actions ; and it would seem as if he were too much attracted by the manner in which these instances suited his hypothesis to examine the meaning of the words any further. But let us recur for a moment to the passage already quoted, in which he urges that "goodness, standing by itself, suggests, above all other things, the conduct of one who aids the sick in re-acquiring normal vitality, assists the unfortunate to recover the means of maintaining themselves," and so on. But further reflection cannot fail to point out that the relative goodness, at all events, which we ascribe to such acts depends on something beyond their tendency "to improve the living of a man's fellows." It would depend in a very large degree upon their motive. At the annual dinner of a charitable corporation, a distinguished city magistrate was once presiding ; and he urged with much impressiveness a remarkable argument to stimulate the benevolence of the guests. "In the course of a long life," he said, "I have observed that any money a man may bestow in charity has the most curious way of coming back to him." Now supposing two men, equal in all other respects, putting the same sum into the plate, but the one doing so out of sheer benevolence, the other for the sake of "the curious way" in which it would come back to him, would not our judgment of the relative goodness of the two acts be entirely different ? The point may be put even more strongly. Cases, it cannot be doubted, have occurred, in which benevolent institutions, which have conferred incalculable good on posterity, have been founded in pursuance of a positively evil motive, in consequence, for instance, of hatred of a relative, or perhaps from an ignominious endeavour to escape the consequences of a life of sin. Whatever the advantages which result from such an act, we condemn it morally by sole reference to its motive. It is as intrinsically wrong as a false calculation or a bad syllogism ; and we may thus call precisely the same act good or bad according to the motive which prompts it. These momentous considerations are indissolubly intertwined with our conceptions of goodness ; and a book on Ethics would appear self-condemned which starts by disregarding them.

11. But these maimed notions of goodness and badness form Mr. Spencer's preliminary *data* ; and it would be very strange if satisfactory conclusions were reached from such premises. It is difficult, in fact, to discern any ethical data whatever, properly speaking, in a treatise which rejects any other ultimate test of goodness than that of pleasure,

and which, to say the least, relegates to the background the moral conceptions which have been most potent in the loftiest teachers and the noblest races of men. A few passages in Mr. Spencer's book offer a passing explanation, on the basis of the evolution theory, of the origin of our conceptions of duty, and of moral obligations. But these conceptions are treated as merely temporary stages in the development of conduct; and it is expressly argued that they will disappear. They are described as abstract conceptions, due in the first instance to accumulated experiences of the advantage of controlling the feelings which prompt to immediate gratification by feelings which refer to remoter results; while the element of coerciveness has been introduced by experience of the various forms of restraint—political, social, and religious—which have enforced the authority of these remoter and more complex feelings. But as men become more completely adapted to the social state, they will appreciate more clearly the evil consequences which bad acts naturally produce, and the advantageous consequences which good acts naturally produce. This is the only really moral motive (pp. 120–1), and as it becomes distinct and predominant, it loses the associated consciousness of subjection to some external agency—or in other words “the feeling of obligation fades” (p. 127). This leads to “the tacit conclusion” which, as Mr. Spencer says, “will be to most very startling, that the sense of duty or moral obligation is transitory, and will diminish as fast as moralisation increases” (p. 127). Under such a view moral obligation, which has been hitherto deemed the cardinal principle in Ethics, becomes a mere accident of them. It is neither their beginning nor their end. It arises as a temporary illusion in the process of their development, and the highest attainment of man's moral nature is to live in the simple satisfaction of sound impulses without realising that he is subject to a controlling power or is conforming to the will of a lawful authority. Mr. Spencer admits that this will be to most “a very startling conclusion.” It involves, indeed, a denial that conscience is a permanent faculty in our nature; for if it be, there must always be a pleasure in the consciousness of satisfying it. A conclusion which involves this result appears so complete a paradox that it may safely be left to confute itself and to discredit the argument which leads to it.

12. It seemed desirable to insist on these errors in Mr. Spencer's fundamental conceptions and reasonings, because in a discussion of this kind everything turns upon them. We shall now, moreover, be in a better position to estimate the value of the general system which the author propounds.

He starts from the principle that, as the part cannot be completely understood without a knowledge of the whole, it is necessary, for the purpose of Ethics, to study human conduct as a part of the larger whole constituted by the conduct of animate beings in general. It is not easy to see why this should be necessary. It might as well be argued that we cannot have a science of astronomy without a comprehension of the whole system of the stellar universe. All our sciences have grown up from a careful observation of facts on a small scale and in details, and have been gradually extended from point to point, and from the smaller to the larger generalisations. Of course we can never "fully understand" the part until we understand the whole; but if men of science had commenced their researches into natural philosophy with a general theory of the constitution of nature, they would never have made their present advances. In point of fact, this is what they did attempt in the days before the inductive philosophy; and Bacon's great work was to recall them from these vain speculations to a patient observation of the simple facts at their feet. Accordingly, it has been justly observed by a German critic of Mr. Spencer's work, that it is really a retrogression to the old metaphysical methods.* It is probably, indeed, this attempt to construct a complete scheme of the universe which constitutes the attraction of writers of this school. Every age—every leading school of thought has produced its systematizer, and the modern representatives of the inductive philosophy are as prone as the schoolmen to assume certain absolute principles as their starting-point, and to cut down all the facts of life so as to fit their bed of Procrustes.

13. Professor Calderwood has, however, pointed out forcibly in the *Contemporary Review* for January, that in order to render the evolution theory applicable to moral life, Mr. Spencer has been compelled to modify the hypothesis in a degree which, as implied in an expression used by the author himself, amounts to a complete reversal of it. The operative principle of evolution up to the point at which human conduct begins is "the struggle for existence" between members of the same species and members of different species; and "very generally," as Mr. Spencer philosophically puts it, "a successful adjustment made by one creature involves an unsuccessful adjustment made by another creature, either of the same kind or of a different kind" (p. 17). That

* *Schürers Theologische Literatur-Zeitung*, 27 March, 1880.

is to say, a lion makes a successful adjustment of means to ends when he devours a lamb, and this involves an unsuccessful adjustment on the part of the unfortunate lamb. A similar combination of successful and unsuccessful adjustments is seen in a state of war between human beings; and the "struggle for existence" takes its highest form in such conflicts. But Mr. Spencer feels that a state of war cannot be regarded as the ultimate form of human society; and, on the contrary, he lays it down that an absolute standard of Ethics is unattainable except in perfectly peaceful associations. But how is this abandonment of the operative principle of evolution at its highest stage to be reconciled with the maintenance of the hypothesis? It must be confessed that the transition is ingeniously made. "This imperfectly evolved conduct," says Mr. Spencer (p. 18), "introduces us by *antithesis* to conduct that is perfectly evolved. Contemplating these adjustments of acts to ends which miss completeness because they cannot be made by one creature without other creatures being prevented from making them, raises the thought of adjustments such that each creature may make them without preventing them from being made by other creatures." As Professor Calderwood says, "nothing can conceal, or even materially obscure, the vastness of the contrast involved" in this transition. It is wholly inconsistent with the principle from which, as has been seen, Mr. Spencer starts, that Ethics "has for its subject-matter that form which *universal conduct* assumes during the last stages of evolution" (p. 20). We are introduced to an entirely new form of conduct—a conduct in antithesis—that is to say, in opposition to the former; and it would seem that such an alteration in the main principle of life would in great measure invalidate the attempt subsequently made to explain human conduct by analogies drawn from the process of evolution in general.

14. It must further be observed, that there is another enormous assumption involved in Mr. Spencer's application of his principle to determine good and bad in human conduct. The principle is, that conduct is good or bad "according as its aggregate results, to ourselves or others, are pleasurable or painful." Now, he refers once or twice, in the reasoning by which he reaches this conclusion, to the view of "the optimist," who, "while saying that the pleasures predominate, urges that the pains borne here are to be compensated by pleasures received hereafter." He cannot, of course, be ignorant that the total estimate of life formed by Christians is mainly determined by reference to life hereafter; and it is obvious that if conduct is to be judged by its tendency to produce pleasure as

a total result, its relation to a future life, if there be one, is a momentous element in the case. But throughout the subsequent argument this consideration is entirely omitted. The "life," by the pleasures of which Mr. Spencer estimates goodness and badness, is that of human beings living in society in this world. The bearings of acts on a future state are not for a moment taken into account. Now, undoubtedly, on ordinary theories, it is possible for very important moral conclusions to be drawn without reference to a future life. One who recognises that virtue has those "primordial and independent" characteristics which Mr. Spencer denies to it, may reach very trustworthy *Data of Ethics*, as has in great measure been shown by Butler, from a simple consideration of the constitution of human nature as we find it here. But if a philosopher starts from the supposition that we must contemplate life as a whole in order to estimate the fitness of conduct in parts; and that the sole test of good and bad, right and wrong, is whether their "aggregate results to self and others are pleasurable or painful," it is absolutely imperative that he should take into account the whole of life, whether here or hereafter, unless he can show that there is no continuity whatever between the two states of existence. Mr. Spencer chooses to seek his ethical data in a certain theory of existence in general. That being his position, he has no right to assume, without a word of justification, that a future life for men forms no practical part of such existence. If a Christian moralist were to commence by assuming a future state of rewards and punishments as the basis of his system, he would probably be denounced by Mr. Spencer as commencing with an arbitrary hypothesis. But a negative hypothesis on this subject is just as arbitrary as a positive one. Mr. Spencer has not got rid of dogma. He has only substituted the dogmas of the evolution hypothesis respecting life in this world for the dogmas of theology respecting life in this world and the next.

15. It might be anticipated that *Data of Ethics* of this vague, arbitrary, and unethical character would furnish no very satisfactory guidance, and would go but a very little way towards filling that "vacuum" which Mr. Herbert Spencer contemplates with apprehension. Such is the result; and as evidence that it is so an unimpeachable witness can be adduced. That witness is no other than Mr. Herbert Spencer himself. In his ninth chapter, after expounding the main elements of his system, after having discussed "the evolution of conduct," "good and bad conduct," "the ways of judging conduct," "the physical view," "the biological view," "the psychological view," and the "sociological view," he proceeds

to offer some "criticisms and explanations;" and he commences with a passage which so clearly exhibits at once the general drift and the failure of his argument that it must be quoted in full. At p. 150, he says:—

"We have seen that to admit the desirableness of conscious existence, is to admit that conduct should be such as will produce a consciousness which is desirable—a consciousness which is as much pleasurable and as little painful as may be. We have also seen that this necessary implication corresponds with the *a priori* inference, that the evolution of life has been made possible only by the establishment of connections between pleasures and beneficial actions, and between pains and detrimental actions. *But the general conclusion reached in both of these ways, though it covers the area within which our special conclusions must fall, does not help us to reach those special conclusions.*

"Were pleasures all of one kind, differing only in degree ; were pains all of one kind, differing only in degree ; and could pleasures be measured against pains with definite results, the problems of conduct would be greatly simplified. Were the pleasures and pains serving as incentives and deterrents simultaneously present to consciousness with like vividness, or were they all immediately impending, or were they all equidistant in time, the problems would be further simplified. And they would be still further simplified if the pleasures and pains were exclusively those of the actor. But both the desirable and the undesirable feelings are of various kinds, making quantitative comparisons difficult ; some are present and some are future, increasing the difficulty of quantitative comparison ; some are entailed on self, and some are entailed on others ; again increasing the difficulty. *So that the guidance yielded by the primary principle reached is of little service unless supplemented by the guidance of secondary principles.*"

16. Now, what is this but a candid admission of the practical valuelessness of the principle which was insisted upon with such urgency as the cardinal truth of Ethics, as the one sole foundation of our ideas of good and bad in conduct, and for the sake of which Mr. Spencer has treated as of secondary importance such moral principles as the supremacy of conscience ? Is it credible that a primary principle of which the guidance "is of little service" should have been, as Mr. Spencer had previously maintained, "solely the reason" for our moral estimate of actions, or that it can be "unquestionable" that our ideas of the goodness and badness of conduct "really originate from our consciousness of the certainty or probability that they will produce pleasures or pains somewhere ?"

If, after all, Mr. Spencer has to fall back on the guidance of secondary principles, does he not admit that there are qualities in actions constituting them good or bad, which are appreciable in themselves, independently of the ultimate result of the actions in producing pleasure or pain? His subsequent admissions extend even further than those just quoted. "I go with Mr. Sedgwick," he says, "as far as the conclusion that 'we must at least admit the desirability of confirming or correcting the results of such comparisons [of pleasures and pains] by any other method upon which we may find reason to rely;'" and I then go further, and say that throughout a large part of conduct *guidance by such comparisons is to be entirely set aside and replaced by other guidance.*" But what is to be thought of a principle which "throughout a large part of conduct" is "to be entirely set aside"?

17. The case, indeed, would be somewhat different if the secondary principles on which Mr. Spencer is thus compelled to fall back could only be reached by means of the primary. Mr. Spencer reaches some of them in this way, and expends, for instance, much elaborate argument to reach the elementary principle of the duty of faithfulness to contracts. But he does not uphold so wild a supposition as that the apprehension of this elementary duty cannot be reached independently. On the contrary, he proceeds in one of the most effective passages of his book to controvert Bentham's assertion that happiness is a more intelligible end than justice; and he urges the important truth, that all people, however primitive, have some conception of justice. "Though primitive men," he says, "have no words for either happiness or justice; yet even among them an approach to the conception of justice is traceable. The law of retaliation, requiring that a death inflicted by one tribe on another shall be balanced by the death either of the murderer or some member of his tribe, shows us in a vague shape that notion of equalness of treatment which constitutes an essential element in it. When we come to early races who have given their thoughts and feelings literary form, we find this conception of justice, as involving equalness of action, becoming distinct. Among the Jews, David expressed in words this association of ideas, when, praying to God to 'hear the right,' he said, 'Let my sentence come forth from thy presence; let thine eyes look upon the things that are equal;' as also, among early Christians, did Paul, when to the Colossians he wrote, 'Masters, give unto your servants that which is just and equal'" (p. 164). But if the ideas of fairness and equity are thus recognised among all

people, even in a primitive condition, to such an extent as to afford a practical guidance in life, while ideas of happiness are so vague that they must "be entirely set aside," it seems evident that we have here an independent test of the goodness and badness of actions; and that the real *Data of Ethics* are to be found in those old principles of "doing unto others as you would be done by," and of "loving your neighbour as yourself," which are not sufficiently scientific for Mr. Spencer, and which are a part of that "supernatural code of Ethics" supposed by him to be disappearing.

18. After this practical collapse of the argument, it would seem scarcely necessary to carry the analysis of Mr. Spencer's work further. He proceeds to a prolonged discussion of the relative claims of the principles of egoism and altruism, of which it need only be remarked that the conclusion arrived at rests on the strange supposition that, as life becomes more perfect, the opportunities of rendering aid to others will become fewer. The key to the whole question lies in a consideration of a precisely opposite character. The characteristic point in human conduct, considered from without, is, that whereas other animals live independent lives, except during the transitory periods of rearing offspring, every man is an intimate relation of one kind or another with his fellows; and the higher the life, the more numerous and the more varied the relations. As society develops, the duties of men towards each other become at once more numerous and more complex, and consequently the opportunities for having regard to others must increase. It was the special gift of the Roman to apprehend the conditions of social life; and the title of Cicero's work, *De Officiis*, points to the heart of the subject.* But it is beyond the scope of this paper to state what are the true *Data of Ethics*, and its necessary limits would exclude the attempt. The object in view has been to examine the claim of Mr. Herbert Spencer to have found "for the principles of right and wrong in conduct at large a scientific basis;" and thus to have superseded, not merely "a code of supernatural ethics," but all previous systems of morality. Respect to the reputation of the author required that such claims should be strictly investigated; and the result seems unmistakable. An ethical system professing to be founded upon the evolution hypothesis commences with assuming the "antithesis" of that theory

* See some valuable remarks on this point in the second of the Rev. J. Gregory Smith's *Bampton Lectures*; 2nd edition, 1876.

as the basis of human conduct. It proceeds by immense and arbitrary assumptions respecting the scope of human life; and its primary principle is reached by a logical fallacy. This principle, on being worked out, proves so inapplicable that, by the author's own confession, "throughout a large part of conduct" it must be "entirely set aside;" and we are invited to fall back upon those primary intuitions of equity which are acknowledged to be everywhere operative and intelligible. Such a system will not supersede Revelation; nor is it likely to displace the old *Data of Ethics*, whether Greek, Roman, or English.

The CHAIRMAN.—I need scarce ask whether it is the wish of the meeting to return thanks to Professor Wace for his exceedingly able and interesting paper upon a subject the importance of which it is difficult to overrate. It is now open for any one to offer remarks thereon.

Rev. C. L. ENGSTRÖM.—I have made a few remarks on the margin of my copy of the paper, and, with your kind permission, will briefly refer to the pages thus noted. With regard to what is stated in § 5, as to the argument of Aristotle, a thought occurred to me as to the application of the passages quoted. I think we are apt to overlook the great value of the writings of Aristotle, Plato, and others, and to suppose that they do not come at all into the current of Christian thought, that in fact, having the Bible in our hands, we may dismiss all such books, and treat them as if they had no existence. But the Bible is certainly founded as much on the principles of morality, and as fully presupposes them as it presupposes such elementary things as grammar. It appears to me that the great principles of morality are, in the Bible, taken for granted, and that therefore they are really pre-supposed, just as the Bible pre-supposes the principles of grammar and of ordinary thought. In § 6 of the paper, Mr. Herbert Spencer, who is there quoted, alludes to the doctrine of altruism; I do not know whether he affirms it himself, or whether he does not think that the right view is that of complete self-abnegation. Now here I would refer to an interesting point in the catechism of the Scotch Established Church, which, in going through the last six commandments, lays down the duty we owe to *ourselves*. For instance, in the case of the eighth commandment, the notion there given is that the words "Thou shalt do no murder" are to be understood as including the taking care of our own lives. This, I think, shows the high common sense of the Scotch, and the idea certainly is found in the Bible, because we are not told to love ourselves less than our neighbours, or not at all, but we are all put on an equality, we are to love our neighbours as ourselves, and to love God better. This is a point which, I think, is very much overlooked, and there are many persons who are apt, from their study of the Bible, to hold the extreme doctrine that we

ought to take the highest possible view of self-abnegation and act accordingly, which is impossible. I am here reminded of the simile of the planets. We find that the various planetary orbs revolve round the sun : each has its own definite sphere, and has no business to go out of its particular orbit. So is it with ourselves. Each of us has a great duty to perform as regards himself, and in performing that duty properly he is really performing a duty both to others and to God. With regard to that which forms the principal point of this paper—the conclusion arrived at by Mr. Herbert Spencer that goodness is identical with pleasure—I suppose that we as Christians would allow, as Professor Wace says, “that moral goodness leads to blessedness” (§ 8). But why is it so? It is for this reason, we find in that Being in whom we believe a number of perfections which are His own attributes and proceed from Him. We call Him “all blessed” and we mean one who is all good and all blessed, and who made those two things “goodness” and “blessedness” to exist. Then, according to our belief, we should look for these two things as *co-existent* everywhere, and we must naturally expect the greatest goodness along with the greatest blessedness, because those who are best in virtue are likest to God, and therefore God will give them the largest amount of blessedness. But this is a different thing from saying that blessedness *is* the sum of virtue. We regard the two things as being together, we do not know how, but that the two always go together is no proof that they are always the *same thing*, and that one is caused by the other. There is just one point more on which I would venture a remark. I believe that the only way of understanding Mr. Herbert Spencer’s philosophy is to look into what is his own main idea. The reason why such authors are so much read, appears to me to be this ; and I do not think they need regard it as any cause for congratulation : their ideas are generally exceedingly simple, not to say oftentimes very shallow and narrow. They persuade people to applaud these ideas as very clever, because the novelty and simplicity are very attractive, and they are, of course, able to carry them out to a considerable extent. Now Mr. Herbert Spencer has one admirable gift, I mean that he possesses a wonderful eye for those endless multitudes that are to be found in God’s universe, and which are so often spoken of in the Bible. His whole scheme of thought runs in the nature of parables, and his books teem with them ; this is what makes his works so interesting. But they are not the less shallow and narrow in their philosophic principles. It reminds me of Charles Dickens’s account of Mrs. Gamp’s bedroom. There was no safety in the bedroom if you did not keep in mind one thing, and that was the huge four-poster which nearly filled the apartment. As long as you kept your eye on that you were safe ; but if you turned to look at anything else you were sure to run your head against something. (Laughter.) Such is the effect of Mr. Herbert Spencer’s whole philosophy. It rests on a belief that the atoms are moving about, and that they have a certain tendency when moving in one direction to continue circulating in the same direction. This is what he means by the various rhythms. These atoms he supposes to get into a

complex state and they are then physical rhythms, in a more complex state they are biological rhythms, and in a still more complex state they are sociological rhythms. Here you see why he has to say what we have heard about happiness. He sees these atoms in a certain theological rhythm. He cannot find anything like virtue in a system like that, and therefore he starts by assuming that you must make virtue bend to this idea—you must lay it down that that which virtue produces is happiness, and, therefore, that virtue is happiness. He seems to think that these rhythmical motions do produce happiness, and that virtue must come under that head, as it cannot come into his system in any other form. The answer to his system is that these rhythmical motions are not everything, and after a short time we shall probably find the ideas that run throughout his philosophy exposed as fallacious and insufficient.

Rev. FLAVEL COOK.—It is hardly fair to ask Professor Wace to explain another man's theory ; but it would be interesting to know how the following case would be dealt with by Mr. Herbert Spencer. It may be known to those present that there was, so to speak, sanctioned in Japan a certain relationship which would be unhesitatingly and universally condemned in this country as a vice—nothing more nor less ; but there it was considered as a matter promoting the greatest happiness of the greatest number. It was by no means reprobated, was a well-established usage, and was regarded as tending to make life easier, to put the conditions of marriage and happiness within the reach of many who would otherwise not be able to obtain such conditions. We will suppose that the Japanese having only a very limited idea of man's being, and the object of man's true happiness, would say on their theory of human nature : " This is good ; pleasure is the result ; therefore it must be good." Let us suppose, also, the entry of God's word, giving them light, so that they become aware of the higher end of existence—that there is something beyond the physical relations and the various requirements of society—that there is such a thing as the consciousness of a spiritual nature ; they would then say : " What we have hitherto thought of only as pleasure, we now know to be evil." Query,—as soon as they accept the spiritual teaching brought to them from the West—the teaching that man has a higher organization—that there is a higher aim for man's being than simply to eat and drink and enjoy himself as a mere animal—do their actions become bad ? Were they good at first ? They suppose they were. Do they continue to be good, or are they now rejected as bad ? If so, were they bad at first ? I should like to know how, according to Mr. Herbert Spencer's view, this point would be dealt with.

Professor WACE.—Perhaps it is, as Mr. Flavel Cook says, a little hard to call upon me to answer such a question. The problem is, indeed, precisely one of those which I should like to put to Mr. Herbert Spencer himself if he were in this room. One of the great difficulties of his theory is that it is hard to see how it can condemn any experiment in morality. Mr. Spencer says that we must have a general knowledge of the conditions of

human life, and even of inanimate life, in order to be in a position to judge adequately of conduct, and, if so, it would seem a very rash thing to condemn beforehand an irregular experiment of the kind referred to. That is the way in which the matter strikes me ; but I should all the more like to know what Mr. Spencer himself would say upon the subject. Mr. Herbert Spencer admits however, that he is obliged to give up his primary principle and to fall back on the simple elements of equity, and if any practice of the kind in question could be shown to involve injustice to another, he would perhaps say that it is thereby condemned at once. But my point is, that so far as he says this, he gives up his general principle.*

Professor STANLEY LEATHES, D.D.—I have been called upon to say something, but I am not really competent to speak on the subject of the paper before us, because I have not read Mr. Herbert Spencer's work on the *Data of Ethics*. I have only gathered, very vaguely, some notion of it from other treatises ; but it seems to me that the question of Ethics has really been solved ages ago by the Mosaic law. I think when one endeavours to probe to the bottom the reason why the Ten Commandments were given, the only reason that can be found is that they are in accordance with the constitution of nature. Take them one by one, and this seems to be the only ultimate reason that can be discovered for those laws being given, or for their existing in themselves, or for their being commonly recognised, and therefore I think that the Mosaic law guides us to a very important result in these questions, because it is virtually based upon two grand principles, one being the revelation of God ; and the other, what is good for man in his social relations. So that the Mosaic law virtually propounds the connection between religion and morality. Now, in the present day, it is constantly endeavoured to sever this connection between religion and morality, and to say that we want no religion if we only have morality. I think that that is just one of the questions that can only be tried by experiment,† and I think that we can come to no conclusion but that we cannot have morality unless we also have religion. (Hear, hear.) This religion, according to the Mosaic law, is involved in the assertion,—“I am the Lord thy God.” Everything turns on that ; that is the foundation of the whole moral code as it is afterwards given. First of all, we have the revelation of the person of God, and the fact that He claims to stand in a particular relation to every human being ; while, in consequence of the relationship in which every human being stands to the God who thus reveals Himself, we have the fact of our constitution ; for, if God thus reveals Himself to us, it is solely because we are His creatures, and He has given to our nature the power of recog-

* Mr. Herbert Spencer was unable to attend the meeting, and has informed the Council that he will take an opportunity of replying to his critics ; the question alluded to by Mr. Flavel Cook was amongst those placed before him.—*Ed.*

† As in France in 1793.—*Ed.*

nising Him as the Creator, and there branch out of our relationship to Him the duties that devolve on us with regard to each other. We see that these duties of religion are expounded in the Mosaic Law in the first four commandments, out of which come the duties that devolve on us in relation to our fellow-creatures. If we take each one of the commandments separately—say the fifth, or sixth—we cannot understand why there is any duty devolving upon us towards our parents, except because of some primordial and original constitution in society, which is in the majority of cases sufficiently plain, certainly. Persons are trying to find out some other principles, but I do not think they will find any that will set aside or render superfluous those that are involved in the Mosaic law. With regard to the law of murder, one speaker has said it involves the preservation of one's own life, which, of course, is perfectly true. We cannot take another person's life, because he has the same right to his life that we have to ours ; and the injunction is mutually operative to protect our own lives, as well as to protect the lives of others. We are safe, because that which prohibits us from injuring others, also prohibits them from injuring us. That is the constitution of our nature. You may probe as deeply as you like, and you cannot get at any other result than this constitution of nature, which is, of course, an indication in nature of the work of God. With regard to a much more difficult subject—such, for instance, as that alluded to by one of the speakers, the relations involved in the Seventh Commandment—I do not know how we are to answer any question relating to that commandment, if we do away with the sanctions given in nature and confirmed by the Mosaic law. (Hear, hear.) It seems to me that the ultimate reason for morals and ethics—the only ultimate reason we can arrive at—is to be found in something in the constitution of our nature as God has made us which is in strict accordance with the moral law, the moral law being proved to be Divine, because of its exact accordance with the ultimate constitution of nature. (Applause.)

Rev. FLAVEL COOK.—I thoroughly agree with all that Professor Stanley Leathes has said as to the supremacy of the word and law of God—a perfect law which, like a crystal, true in every face and every angle, fits the whole of our personal nature in spirit, soul, mind, and body. Still, what we have to do with Mr. Herbert Spencer's argument is, not to show that the word of God is superior, but that the ground taken by Mr. Spencer is, on his own showing, not sustainable—that it breaks down—that it does not provide for the conditions of human nature—that there is a quality in man and a craving in man for something higher than physical organization will supply. This spiritual craving demands something more than Mr. Spencer offers, it breaks through all artificial restraints and theories, and asserts itself ; and when it does this, what provision has this propounded theory of perfect human nature to offer ? I will here relate a striking story which I heard a few days ago. There was an old man in China who had for years worshipped the sun, moon, and stars, and invoked them to help him remove the load which oppressed his spirit. It happened that a man who had come from

this side of the world, spoke in that man's hearing some of the words of Truth, and that old man, blind as he was, started to his feet and said, "That is what I have been longing for." There was something which that old man had carried in his heart for years ; it had asserted itself, but nothing had been presented to him that could meet the craving he experienced until the word of Christ's Gospel was set before him. Such a system as that which Professor Wace has brought before us to-night offers nothing to meet such a want as this. (Hear, hear.)

Professor LEATHES.—I did not endeavour to upset Mr. Herbert Spencer's theory by an appeal to the Mosaic Law, but merely observed that his principles do not go sufficiently into the depths of the constitution of our nature, which, if examined, would be found deeper than he supposes, and which he does not thoroughly consider, but which are in strict accordance with the Mosaic moral Law.

The CHAIRMAN.—Before calling on Professor Wace to reply—if a reply there can be where there has been no opposition—I may be excused for making one short remark. It seems to me that this doctrine of Mr. Herbert Spencer's fails in one great respect, namely, it gives no explanation at all as to why we pass moral judgments on actions. (Hear, hear.) It seems to me that it would only lead us to form a judgment as to whether a course of conduct was expedient or not, having regard to its consequences ; but we are conscious that we have in ourselves a notion as to an action being right or wrong, utterly irrespective of consequences. We cannot define what this feeling is ; it is properly a moral sense. I do not say that we have an instinct within us which affords a correct guide as to whether an action is right or wrong. Conscience needs to be cultivated, or it may give very wrong judgments. No doubt, in many countries, under a wrong system of religion, the conscience is perverted, so as to lead people to think things meritorious, which we, under a better system, consider exceedingly wrong ; but, at the same time, there is a moral judgment in our nature which says a thing is right or wrong, and we feel it to be something which perfectly differs from a judgment as to whether an action will produce beneficial results or not. (Hear, hear.) From this I should draw the conclusion that there is, as Professor Stanley Leathes has said, a supernatural element in our nature, which is far deeper than all the judgments that are formed as to the general results of actions—that there is a principle implanted in us by which we judge of things as right or wrongs and which was intended to lead us to conform ourselves to the rule of what is right and wrong according to the Divine will. (Applause.)

Rev. J. W. BUCKLEY.—This thought has occurred to me ; how can Mr. Herbert Spencer tell what particular acts will in the long run produce more pleasure than pain ? This is a question not easily answered. It seems to me to be impossible for any one to determine what particular deeds will, in the course of centuries,—nay, of an eternity, supposing the human race to

last for ever on earth, and entering into no considerations as to a future life, —produce more happiness than misery, more pleasure than pain. I cannot see how any merely human mind can settle this point. (Hear, hear.)

Professor WACE.—It would be unreasonable in me to say much more after having already occupied the time of the meeting at such length, especially as so little has been said by others on a subject which, considering its importance, I could have wished to have had thoroughly discussed. The Paper which has been read does not pretend to make an original contribution to the ethical problem under discussion; but the point which struck me about this book, as soon as it was published, was, that here appeared to be the final result of the evolution philosophy as applied to human life, and as explained by the chief representative of that philosophy. It was natural to address oneself at once to such a work in order to learn what this philosophy had to tell us as its final outcome and total result. It is difficult to go adequately into this philosophy in its physical aspect; but when a man speaks about ethics, many of us have the means of appreciating his arguments; and I consequently read the book with serious interest. The main point that struck me, and which I have endeavoured to illustrate in this Paper, is, that the author has not mastered, at all events, the great contributions to ethics made in former times, and that whatever may be the ultimate conclusions come to on the matter, his reasoning is thoroughly unsound. If, as the total result of all this speculation, you are offered a mass of simply fallacious reasoning, considered merely as reasoning, that appears to be a remarkable result, and one to which attention ought to be called. I am inclined to think the time has come when one may cease to be quite so polite as people commonly have been to some of this philosophy. Personally, of course, we owe all respect to the writers, and I trust there is not a word in my Paper that can be deemed disrespectful to Mr. Spencer; but I think we ought to cease to be respectful about argument, and that we should hit an unsound philosophical proposition just as hard as an advocate in a court of law hits the bad reasoning of another advocate. (Hear, hear.) As to the point just adduced by Mr. Buckley, with regard to Mr. Spencer not being able to calculate pleasures and pains, I have shown that this is exactly what Mr. Spencer admits. He cannot calculate such results, and if a man builds up a theory on principles that cannot be carried out, we know what becomes of the theory. In short, in considering this book, I am reminded of a story told, I think, of Voltaire, who said he had only two objections to the title of the "Holy Roman Empire,"—the one being that it was not holy, and the other that it was not Roman. (Laughter.) In the same way it may be said of this book, on the *Data of Ethics*, that there are two objections to the title; it is difficult to find the *Data*, and equally difficult to find the Ethics. The data resolve themselves into assumptions, and the ethics into physics.

The meeting was then adjourned.

REMARKS BY THE REV. PREBENDARY W. J. IRONS, D.D.

Whether the doctrine of Evolution is in accordance with what is to be ascertained of the physical universe, is a question of fact which, as Professor Wace observes, must be determined by the observations of men of Physical Science, and may for the present be left to them. But Evolution in Morals may be no more than an expression of that advancement of the germ in every conscious agent which is implied in his development and education, and is acknowledged, in some form, by all who take our present life to be imperfect in many ways, and so, possibly, a life of probation altogether for a higher sphere. Indeed Evolution, whether physical or moral, implies movement towards the more perfect; and it is strange that there are men of science often so deficient in philosophy, as to fail to see that Evolution presupposes an ideal towards which it proceeds. Just as an illogical procedure is wrong in itself (as Professor Wace points out) quite apart from the "pain" which it may ultimately occasion, mentally or bodily; so an act of injustice or unfairness is felt to be absolutely wrong, offends an *ideal*, in addition to the pain it occasions.

When Mr. Spencer says, an act is called "bad," "solely for the reason that it entails pain," he does not, of course, mean only bodily pain: but if he includes mental pain, then he admits that the conscious being has some constitution of his own, the violation of which is distressing. In other words, the conscious being is in relation with a previous ideal. It seems to me that Mr. Spencer's analysis always implies an *a priori*; and that there is frequently no difficulty in accepting, in modified terms, what he says as matter of fact, reserving altogether the determining principles. I should be glad that Mr. Spencer should consider this; and also consider that his notion of finding "a scientific basis" for first principles involves a contradiction. What may be called Mr. Spencer's diagnosis of morals is full of interest; just as Aristotle's doctrine of the "mean" is replete with practical reality. But the failure to understand the relation of the conscious being to the absolute is the conspicuous defect in both cases.

A grave error into which Mr. Spencer has fallen is not entirely his. He has been led to regard the only antithesis to his view as some system of *supernatural ethics* dependent solely on revelation. Of course there are fanatics who conceive that revelation creates the moral nature, instead of addressing itself to that nature. But to assail this is to make war with a shadow.

And, finally, with reference to all Mr. Spencer's moral analysis; even were it admitted to be complete, it is impossible to persuade anyone that human action is really determined by analytical considerations. The spring of action can never be so found. It must be a previous principle. Even if he should

maintain that his analysis ought to determine conduct, the fact remains, that it does not. And, as I said many years ago, in my book on *Final Causes*, "The facts of human nature are the data for the science of human nature."

The necessity of *ready* action, not only in each great crisis, but, frequently, in every step and stage of action (in the midst of which a pause is often impossible), shows that we act on something more than analysis, more than calculation ; even on that which, express it as we may, is practically, and always, an instinct of our own, though also a common instinct, or that which we have in communion. Since Locke, all our philosophy has suffered by overlooking this. The ignoring of the *a priori* will in our times, however, avenge itself. Truth and fact cannot ultimately be put down by theory ; as Mr. Spencer will find.

ORDINARY MEETING, FEBRUARY 2, 1880.

REV. ROBINSON THORNTON, D.D., VICE-PRESIDENT,
IN THE CHAIR.

The minutes of the last meeting were read and confirmed, and the following election was announced :—

ASSOCIATE :—Rev. P. F. Nursey, B.A., Radnor.

Also the presentation of the following Work for the Library :—
Proceedings of the Royal Society. *From the same.*

The CHAIRMAN.—I have great pleasure in introducing Mr. Rassam. (Cheers.) The name of that distinguished traveller is well known, not only in connection with the subject of his paper, "Recent Assyrian and Babylonian Research," to the success of which he has contributed as much as, if not more, than any living man ; but I also think we have heard of him as engaged in Abyssinia. (Cheers.) He may indeed be termed a perfect citizen of the world, for he has not confined his travels to Europe and Asia, but we hear of him in Africa also. It is, however, in connection with Asiatic research that he now appears before us, and I am glad to have the opportunity of introducing one so eminent on this his first visit to the Society of which he is now a member. I am sure his paper will be found extremely interesting, and that he will be able to afford a satisfactory reply to any question that may be put to him at its close. (Cheers.)

The following paper was then read by the Author :—

RECENT ASSYRIAN AND BABYLONIAN RESEARCH.

BY HORMUZD RASSAM, ESQ.

IN a former paper, which I read some time ago before the Society of Biblical Archaeology, I gave an account of my researches in Assyria, which I had carried on there in 1877, for the Trustees of the British Museum ; and now, in this paper which I have the pleasure to read before you, I intend to give a résumé of my last explorations in Nineveh and Babylon, with a description of the different ancient sites existing there at present.

2. To those who are interested in archaeological research, and more especially with that part of it which relates to the inspired writings, there is something more than fascinating to

the Christian mind which has been associated since childhood with the account given in Holy Writ of Jonah's divine mission to Nineveh, of Sennacherib and his carrying away the ten tribes to Assyria, and Media, and of Nebuchadnezzar and the Jewish Captivity.

3. The widespread fragments of pottery, brick, and stone, (the remnants of those two ancient cities of Chaldea, and Assyria,) which are scattered all over those countries, give evident signs of the utter destruction of those great kingdoms, and stand as a living monument to God's vengeance in visiting them with His wrath for their pride, wickedness, and boasting, even against Jehovah Himself, who said, "To me belongeth vengeance and recompense!"

4. I must in the first place give you an outline of the existing different routes through which a traveller can visit Nineveh and Babylon; and to do so Mossul and Baghdad must be touched at, as they are nigh to those Biblical cities, especially as the traveller will be able to supply himself therefrom with the necessary provisions for the journey. Mossul stands on the right bank of the Tigris, and Nineveh is on the opposite side of the river, while Baghdad is situated about 300 miles lower down on both sides of the same river; but Babylon, or at least the site of its ruins, stands on the left bank of the Euphrates, about sixty miles to the south of Baghdad. There is a town of some importance in the proximity of Babylon which is generally thought to be in the centre of its ancient limit, called Hilla; but travellers who proceed so far east would like, while being in the neighbourhood, to visit the renowned city of Haroon el-Rasheed, and the ruins of Seleucia, and the Parthian palace of Ctesiphon, in the vicinity of Baghdad.

5. At present there are several routes which a traveller may take in visiting Mossul and Baghdad. One of those which I generally take, and which is the safest for an ordinary traveller, is by starting from the Port of Alexandretta, or Iscanderoon, and going over the Bailan Pass, about 2,000 feet above the level of the sea, and crossing the Plain of Antioch, leaving the Lake on the right, and arriving at Aleppo, after being knocked about from the rugged state of the road, in three days' slow marches; the whole distance not being more than sixty miles.

6. It is necessary for a traveller who wishes to make his long journey with ease and comfort to spend two or three days at Aleppo, the supposed site of Zobah, in order that he may provide himself with servants, riding and baggage animals, the requisite supply of provisions, such as sugar, butter, coffee, tea, spices, rice, and flour; because these necessaries

cannot be obtained in the villages. The only commodities that can be obtained away from large towns are fodder for the animals, fuel for cooking, milk, eggs, fowls, and sheep if required, there being no butchers in the rural districts. If a traveller cannot do without meat, he has to buy a live sheep or goat, and have it slaughtered, the price of which is not ruinous, as the best can be purchased for four or five shillings; and considering that in the cool weather the meat can be kept for two or three days, and the interior parts, with the skin of the animal's head, and trotters, which are generally given to the host to make his heart glad, it is good policy sometimes to indulge in this extravagance.

7. From Aleppo there are two ways of proceeding to Mossul; one is by way of Diarbekir, and the other is *via* Orfa (the ancient Eddesa, or the supposed site of Ur of the Chaldees), but both routes meet again at Nissibeen, or Nissibis. The former route is considered the safest, but the latter the quickest. After leaving Aleppo, the traveller crosses the Euphrates by the ferry at Birajeek, after three days' slow march through an almost level plain. Thence he proceeds to Orfa, through the plain or hills of Serooj (Serug of the Bible), or diverges northwards to Diarbekir, over the Karach-Dagh, which means "craggy mountain." During the hot season the last-mentioned route is preferable for the benefit of cooler air and better supply of water, though it is two days longer than the other. Both the roads, by way of Orfa and Diarbekir, meet at Nissibeen, and here it is left to the traveller to go on to Mossul direct, leaving the Tigris on the left and the mountain of Sinjar on the right,—risking an encounter with Arab marauders who would dispossess him of whatever he has, even to the clothes he wears, if he try to resist them; or cross the river higher up at Jazeera or Paishapoor, and finish the journey on the left side of the Tigris, on the confines of Assyria proper, until he crosses a bridge of boats which connects Nineveh with Mossul.

8. From Diarbekir, a traveller who likes ease more than sight-seeing, can go down to Mossul on a raft of sheepskins; but as the Tigris is very rocky and rapid between Diarbekir and Mossul, he might be upset in passing some of the rapids, and lose his baggage in the river. I do not, however, remember hearing of any such accidents occurring to any European traveller, as the native raftsmen know those rapids well, and make their passengers disembark and walk along the river side at the dangerous parts.

9. From Mossul, the traveller can either float down the

Tigris to Baghdad, or travel on horseback on either side of the river through Mesopotamia, or Irak. The Mesopotamian route is more easy and shorter by four days, but it is not always safe. The objection to the other route is the existence of a large number of troublesome rivulets, besides the greater and lesser Zabs. In the Mesopotamian track there are scarcely any towns or villages worth mentioning, but on the opposite side there are two towns of importance, which are, Arweel, or Arbela, and Karkook, beside other large villages. The easiest and quickest way to go down to Baghdad from Mossul, is to float down the Tigris on a raft, and when the river is high the 300 miles can be accomplished in three days and nights.

10. From Baghdad to Babylon a traveller can do the journey in three days' slow marches, through Southern Mesopotamia on level ground as flat as a table and as sandy as the seashore, though from all appearances the whole country must have been formerly thickly inhabited, and richly cultivated, from the remains of the canals which are still visible all over the country. As there are no villages between Baghdad and Babylon, some charitable Moslems of Baghdad have built a number of khans or karavansaries at intervals of about fifteen miles for the convenience of the wayfarers and pilgrims who visit the shrine of Hosain at Karbala.

11. Before I proceed any further I must not omit to mention the mode of housing oneself on the journey in those parts. It is always advisable for a traveller to carry two tents with him, one for himself and the other for his domestics, because it sometimes happens that no accommodation can be found on the road ; and if shelter can be obtained, the chances are the place would be so filthily dirty, and infested with fleas and other vermin, that instead of having any rest the traveller would be undergoing torture all the time he remains there. The great drawback, however, to tent-life in those countries, excepting in spring or at the end of autumn, is the discomfort of excessive heat and dust-storms of summer, and the cold and wet of winter. I myself never travelled without tents, though, perhaps, I did not have them pitched once in six months. Whenever I approached a village where I intended to halt I always cantered on about one hour or two before the arrival of the luggage, and as soon as I saw a nice-looking house or hut I entered into friendly negotiations with the person I considered to be the chief inmate of the abode ; and I never once failed to obtain the lodgings I required from the female members of the family, who always came to my assistance when there was any difficulty to surmount. But if there happens to be

an Arab or Koordish encampment a traveller must go direct to the chief's tent, who alone is expected to show hospitality to a stranger of whatever nationality or religion he may be.

12. There is a much shorter route between the Mediterranean and Babylon by way of Dair at the junction of the river Khaboor (Chebar of the Bible), but it is not always safe to travel through that almost deserted country, because, marauding parties of both the Iniza and Shammar Arabs are always going about in those parts seeking for plunder. It is also difficult to obtain the necessary supplies for one's comfort and living through that long journey.

13. There are also two other routes by which a traveller might reach Babylon ; one which is extremely short, but both unsafe and fatiguing, and the other very easy and comfortable, but somewhat long and, to a person who is not fond of a long sea-voyage, might prove somewhat unpleasant and tedious. Those who like to rough it, and are able to ride about 500 miles on the back of a camel and see no life excepting unwelcome Bedouins, who have no scruple whatever to plunder them and leave them to starve in the desert, can travel by coach from Beyrouth to Damascus where they join the English post, which goes on camels fortnightly between Damascus and Baghdad. Travelling in such a manner an inexperienced person must make up his mind to be shaken to pieces the first day he mounts that awkward animal, but as soon as his limbs get accustomed to the jog-jogging of that monster the rest of the journey will seem comparatively easy. This mode of travelling occupies ten or twelve days, and most of the way the traveller is in deadly fear of being plundered or killed by a marauding party of the Bedouin Arabs, or being buried in a sand-storm, or, worse than all, dying of thirst.

14. But a person who is fond of a long sea-voyage can get into a comfortable English steamer in the London Docks, and land in the centre of Babylon by merely changing steamers at Basra at the mouth of the Persian Gulf. He can then travel with great comfort, and fare on English diet on the very ruins of the palace of Nebuchadnezzar. By this last route it would take about forty days to make the voyage, because, generally speaking, those trading steamers have to visit many ports on the way between England and the Persian Gulf to make the voyage profitable. By this route Gibraltar and Malta are touched at in going through the Mediterranean, and after the steamer passes through the Suez Canal and down the Red Sea it touches at Jeddah, the port of the Hijaz or the holy land of the Moslems. Thence she goes to the British port of Aden,

the emporium of Yaman or Arabia Felix, for provisions and coals. Afterwards she proceeds to Muscat, the port of Oman, at the mouth of the Persian Gulf, from whence she goes on to Bushire, a Persian settlement, to discharge, and receive passengers and cargo. When this is done the vessel proceeds to Basra, the Turkish port below the junction of the Euphrates with the Tigris, for the final outward discharge of her merchandise for the use of Southern Mesopotamia and Irak.

15. I fear I have intruded at too great a length upon your time in giving you a somewhat long account of the different modes of travelling in that part of the East whereon my present paper treats; but I deemed it both fitting and instructive to preface my lecture with a short description of the routes that are at present traversed by modern travellers when wishing to visit the countries above alluded to, in order that you may with greater facility follow me in my last journey through Mesopotamia to Nineveh and Babylon.

16. The expedition that I undertook to Assyria in 1878 proved so pregnant with good results, that the trustees of the British Museum sent me out again to exhume more of the buried relics of the past, and although I was not so successful in this last expedition as I was on former occasions, by bringing to England large objects for the public gaze, I was, nevertheless, fortunate in bringing to light interesting records of the old kings of Assyria and Babylonia,—such as Shalmaneser, Sennacherib, Sardanapalus, Nebuchadnezzar, Cyrus, and others. As a matter of course, whenever I start on such expeditions I always make up my mind to bear disappointments, and to work against oppositions, prejudices, and jealousies; but thanks to the energy and help of Sir Henry Layard, Her Majesty's ambassador at Constantinople, who has always been ready to support me, my task has been made easy through his personal influence with the Sultan of Turkey. Most fortunately for me I undertook the last two expeditions during his tenor of office in representing England at the Ottoman capital, and had he not been there I am certain the greater part of my discoveries would have been now buried underground. His first and greatest difficulty was to induce the Sublime Porte to forego some stringent rules which had been framed a few years back (regarding the research for antiquities) to prevent private adventurers from excavating and helping themselves to valuable antiquities for their own benefit. Indeed some explorers, I was told at Constantinople, had actually entered into an agreement with the Turkish Government to give them half of what was found, and that they had broken faith and smuggled

away all the relics discovered, and sold them either in Europe or America. We must not, therefore, wonder at the jealousy of the Porte and the strict rules which they forced upon the late Mr. George Smith, and which they tried likewise to impose on me.

17. Formerly, when Sir Henry Layard, M. Botta, and myself excavated in Assyria, there was no restriction placed upon our researches, and so we could dig wherever we liked, and send to Europe any relics we might find without let or hindrance. But, as I said before, that since it came to the knowledge of the Sublime Porte that private individuals were enriching themselves by digging out ancient relics, and sending them to Europe for sale, the Ottoman Government framed certain rules which prohibited anyone from digging for antiquities without the special sanction of the Minister of Instruction, and obliged the explorer to give one-third of the objects discovered to the Porte, one-third to the owner of the land where the relics are found, and the other third he was to keep, and if exported to pay a heavy duty thereon. That a special delegate would be appointed to watch the work, and all expenses incurred on the appointment of the said delegate, with a proper guard, be borne by the excavator. The Firman which Sir Henry Layard obtained for me dispensed with all these restrictions, and it only stipulated that we should give the Ottoman Museum every duplicate we found. To this we had no objection, considering that we did not wish to fill the British Museum with unnecessary counterparts. Moreover, almost all the inscriptions that we have found are separate specimens; but when I tried to give the delegate some sculptures and other antiquities which we did not want, he looked suspiciously at them, as if my reason for giving them to him was because they were not thought to be worth keeping by us.

18. Most of the mounds in which ancient remains are found in Assyria and Babylonia are private property, and to enable us to make excavations thereat, it is necessary, independently of the Firman, to indemnify the landlord before the work can be commenced. It had always been the rule with Sir Henry Layard and myself not to enter into an agreement with the landlords, but merely to reward them with a small present which we deemed sufficient for the purpose; and it is an astonishing fact that during our several expeditions we never had any dispute on this head, and none of the landlords ever gave us a moment's trouble, or interfered in our work, even if we chose to destroy or dig up all their ground and render it unfit for tillage. Indeed, a great number never troubled them-

selves to ask for indemnification for any damage done, as they all knew that we were sure to punish any of our *employés* who wantonly did any damage to the property, or trespassed upon any domain without our sanction.

19. It was generally considered all over the country, and established as a precedent, that I could dig anywhere I liked, as it was known by all that I was always ready to reward anyone as he deserved. Indeed, I have been very often accosted on my travels by men and women who had an artificial mound in their patrimony, or near their village, to go and examine the old ruins, which they declared contained antiquities and treasure. It is very curious that though the French and ourselves have been exploring in that country off and on for nearly forty years, and employed thousands of the natives in the diggings, and all know that none of us have ever found any treasure, yet the idea of the hid precious metal can never be disassociated from the minds of the generality of the people of that country. Had I to follow the red-tape system, I might not only have been imposed upon, and made to pay most exorbitantly for the privilege of digging, but I should, most probably, have been prevented altogether from attaining the object of my mission, seeing that it was particularly set forth in my Firman that to enable me to excavate in a private ground it would be necessary for me to obtain the sanction of the landlords, as if I could possibly intrude on any private domain against the wishes of the owner! I was also prohibited from digging in any mound which contained a graveyard, or where the ground was considered sacred; and had this clause been strictly followed, most of the valuable antiquities would have been now and for ever lost to the literary and scientific world.

20. Two incidents in connection with the landlords, one which occurred in Sir Henry Layard's time, and the other during my superintendence, raised us immensely in the estimation of everyone, especially those owners of land who possessed in their property ancient remains. When I rejoined Sir Henry Layard at Constantinople in 1849, one of the landlords of Koyunjik happened to be there to solicit some pecuniary assistance from two grandees of Mossul who held high positions at the Turkish capital; but it appears that he did not meet with success. On finding him in distress I represented his case to Sir Henry Layard, who immediately gave him a suitable present, which the poor old man never forgot till the day of his death, in the beginning of this year. On returning to Mossul he reported in high glee everywhere the kindness and liberality of the English, and as he took care not to say what

we gave him, and if he did, he must have exaggerated the amount, it was thought that we had enriched him for life.

21. The Arabs are proverbially very grateful for any kindness and attention shown them, and consider it a sacred duty to trust a friend. As for acts of liberality and generosity, they are reckoned to be tantamount to praying or fasting ; and they have a common saying which expresses their feeling in the words, "A liberal man is beloved of God though he be a reprobate." But it is very difficult for a stranger unaccustomed with Arab habits and usages to deal with them in a way satisfactory to both parties ; because, if a person is too munificent, he would be thought to be either a simpleton, or looked upon with suspicion, and be imposed upon accordingly ; but were he to act the stingy, he would be held in contempt ; and it is therefore not an easy matter to deal with an Arab in striking a bargain.

22. The other case which gave great satisfaction amongst the Arabs was at the time when I discovered a few Sassanian silver coins in the mound of Koyunjik, and after no end of trouble I succeeded in securing the owner a share of the treasure trove. It was specified in the standing rules that any precious metal found in the excavations was to be divided into three parts ; one-third I was to have, one-third was to be given to the landlord, and the remainder to be appropriated by the Ottoman Government. When that discovery was made, I kept two-thirds, of which to give half to the landlord, whom I knew expected me to protect his share. The authorities of the place asked me to give it up to them, as they said that the British Government was only entitled to one-third, and the rest must be given to them, and they themselves would settle the matter with the landlord. As a matter of course I demurred, as I said that the Firman did not order me to make over the share of the landlord to the local authorities ; but if the owner of the land wished it I should be happy to do so. The landlord was then sent for, and on his being asked to tell me to give up his share to them, he refused to listen to them, and declared that he had presented his portion to me, and no persuasion or threat would induce him to change his mind. Consequently, my victory did not only gain me great praise amongst the populace, but made others in whose ground I wished to dig, but who were afraid to let me do so, waive every objection to my doing so afterwards.

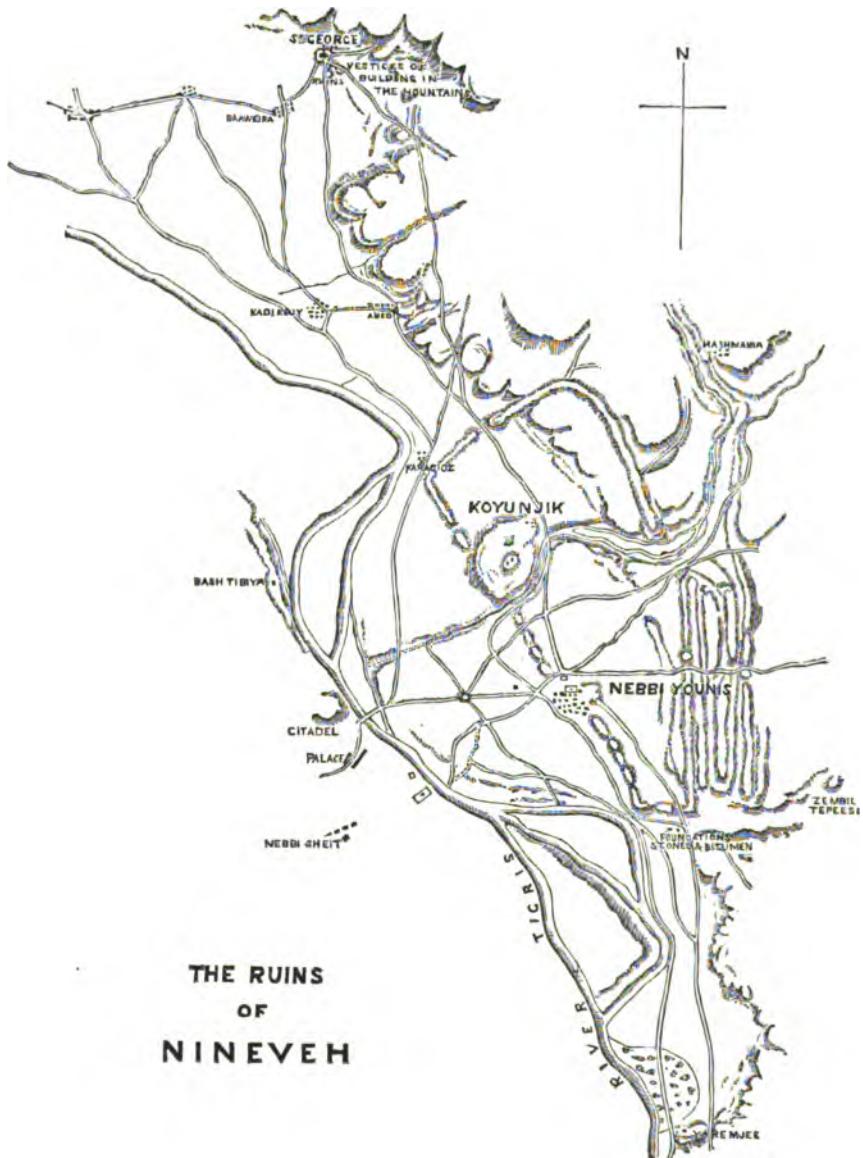
23. Generally speaking, when I found that the land which I wished to examine belonged to a private individual, I appointed two Arab farmers to value the rent of the land, with the loss

of profit on its cultivation while I was making use of it, and reward the landlord accordingly. I always left it to the option of the landlord to let me refill the trenches and smooth down the furrows that had been caused by the diggings, or allow him a specified sum to do the needful himself; and most invariably the landlords chose the latter alternative, as they could then pocket the money and trust to time to do the work needed.

24. There has been so much written from time to time about the researches in Assyria, especially by Sir Henry Layard, who in his two works entitled "Nineveh and its Remains," and "Nineveh and Babylon," has given such an interesting and minute account of his magnificent discoveries, that it would be quite presumption on my part to attempt any addition to his lucid description. I must, therefore, confine myself to describing the nature of my own work and the topography of the ancient Biblical cities.

25. There were four sites of the Royal Assyrian residences discovered on the left side of the Tigris, in what was considered Assyria proper, and which were, I believe, in the time of the preaching of the Prophet Jonah, within the metropolis of Nineveh, these are Koyunjik, Nebbi Younis, Nimroud, and Khorsabad. There are other important ruins within what I consider to be the radius of that "great city," such as Yarimja, Balawat, Karamlais, Bahsheecka, and Shareefkhan. Taking the oblong distance of these different ruins, together with Koyunjik and Nebbi Younis on the western limit, Nimroud on its southern border, and Khorsabad on its northern side, makes the size of the old city around about sixty miles, or three days' journey, as it is mentioned in Holy Writ; because twenty miles are reckoned in that country, according to the travelling of a pedestrian, about a day's journey. In all these mounds there have been discovered Assyrian remains; and at Balawat, especially, I discovered during my expedition to Assyria, in the beginning of the year before the last, the famous bronze gates and temple dedicated to the god of war by Assur-nazir-pal, about which I shall touch hereafter. There are, besides these mounds, several others scattered all over the above mentioned space which must have been formerly temples, or watch-towers to guard the several quarters of the great town, with gardens and orchards enclosed.

26. Nimroud is considered by Assyrian scholars to be the "Calah" of the Bible; but whether this be correct or not, I believe, at the time of the preaching of Jonah, it was comprised within the southern extremity of Nineveh. In this



mound there were four different palaces discovered by Sir Henry Layard during his researches, the oldest of which, whose sculptures were found in better preservation than any other Assyrian bas-reliefs yet discovered, belonged to Assurnazir-pal, the father of Shalmaneser, mentioned in the second of Kings, who reigned about 860 B.C. The second, which is called in Layard's "Nineveh and Babylon" the central palace, was very much destroyed, and beyond a few scattered sculptures and some entrances embellished with human-headed bulls, no complete edifice was found. Here was also found the famous black obelisk now in the British Museum, on which is represented that king's conquest of Cappadocia, Armenia, Media, Babylonia, Syria, and Phoenicia. It is related here also that "Jehu, the son of Omri,"* gave Shalmaneser a tribute of gold, silver, and articles manufactured from gold"; and one of the figures represented on the obelisk prostrating himself on the ground before the great king was either Jehu himself or his ambassador. The third building at Nimroud, which is called the south-west palace, was found very much destroyed by fire; and from the records found on some of the dilapidated sculptures it seemed that this palace was built by Esarhaddon, the son of Sennacherib, who, to save himself the expense and trouble of bringing the required material from a distant quarry, contented himself by removing the sculptures from the other palaces at Nimroud, turned the bas-relief to the brick wall or support, and had his own designs engraved on the back of them. In the chronicle of this king he says that he had built a magnificent palace at that part of Nineveh called Nebbi Younis, but hitherto nothing has been discovered at that mound deserving the praise that Esarhaddon lavished upon it. As I shall have occasion hereafter to refer to this mound, I must pass to the fourth building discovered at Nimroud, called the south-east palace, which was supposed to have been erected by the grandson of Esarhaddon, believed to be Saracus of Berosus, mentioned by Abydenus, in whose time the prophecy of Nahum was fulfilled, when the utter annihilation of that great Assyrian kingdom took place. The style of architecture of this, (scarcely worth the dignified name of palace,) was very inferior to any Assyrian building that has been discovered. It was built, as Sir Henry Layard supposes, when the empire was decaying and art declining, because there were neither sculptures nor paintings visible,

* Assyrian scholars identify this king of Israel with Jehu, the son of Jehoshaphat and grandson of Nimshi, mentioned in 2 Kings ix. 2; and they consider the parental name of "Omri" to have been given to him by the Assyrians from their association with a former king of the same name.

but the whole structure was panelled by rude limestone slabs about $3\frac{1}{2}$ feet high. The upper part of the walls, built of sun-dried bricks, was simply plastered over with lime—a mode of decoration which the Sassanians employed in their buildings after the destruction of the Babylonian monarchy. Below this I discovered the remains of a more ancient edifice, containing a few sculptures which had been brought from the centre palace, belonging to the time of Tiglath-pileser, or Shalmaneser, with a stone tablet or stele representing thereon the king of the time, supposed to be the grandson of Esarhaddon ; and also two detached statues dedicated to the god Nebo, all of which are now in the British Museum.

27. Last year I discovered, not far from the north-west palace at Nimroud, a temple built by the same founder, but the destroying enemy had managed to make so thorough a wreck of the whole structure that there was no trace left of the actual walls ; and even the beautiful, enamelled tiles which must have adorned the ceiling were so broken and scattered about in different directions that, though more than a dozen large baskets were filled with the pieces found, I was not able to complete even a single one for the British Museum. The only objects that I found whole and standing in their original position were a marble altar and what seemed to me a vessel let in the floor of the room to receive the blood of the sacrifice. I also found marble seats for the ministering priests to sit on, or use for some other purpose. Besides these there were pieces of a very handsome tripod, round and square pillars of marble, and stone, with hundreds of inscribed bricks scattered all over the place, with about twelve marble platforms ; some of them contain inscriptions which were so much damaged that no one has as yet been able to read them. These platforms I believe to have been dedicated to different gods for sacrificial purposes ; and I trust when the Assyrian scholars manage to decipher the inscriptions some valuable acquisition may be added to history.

28. At the mound of Khorsabad, where excavations were carried on for the Louvre by the French Government, under the superintendence of MM. Botta and Place, the late French consuls at Mossul, a fine but a ruined palace was discovered, which is said to have been erected by Sargon, the father of Sennacherib.

29. At Koyunjik, which I consider to be the city of Nineveh, Sir Henry Layard discovered the grand palace of the last-named monarch, where it is supposed he was slain by his sons, Adrammelech and Sharezer. At the northern corner of the same mound I discovered, in 1854, another palace built by the

grandson of Sennacherib and son of Esarhaddon, whose name has been read by different Assyriologists as Assur-bani-pal.* This palace was also very much damaged, but from the nature of the bas-reliefs, which were found in good preservation, especially those comprising the lion-hunt room, Assyrian art seems to have very much improved in that period, for any one who takes the trouble to visit the basement Assyrian room in the British Museum cannot but help admiring the spirit in which the different animals used for the chase are delineated; and whether one looks at the lions charging, or suffering from the wounds inflicted, or lying dead, hounds chasing the wild ass and deer, and others being held by a leash, he sees the true spirit of art therein depicted.† In this very palace were discovered the Creation and Deluge records, with thousands of other inscribed terra-cottas, which have thrown lustre on the obscure ancient history, and brought to light a number of Hebrew, Assyrian, and other Gentile kings whose names had been missing. Amongst the latter I discovered a perfect decagon terra-cotta cylinder covered with nearly 1,300 lines of fine inscription, recording a history of about twenty years of the reign of Assur-bani-pal, or Sardanapalus, about 640 years before the Christian era, including an account of the utter subjection of Egypt, and his supremacy over Western Asia. On a former expedition I had discovered a duplicate copy of this cylinder, which was in a dilapidated state, and a good deal of it was missing; but this new find has enabled Mr. Pinches, of the British Museum, to refill the broken parts.

30. Formerly Assyrian researchers did not consider it worth the expense to clear out all the débris from the buried chamber, seeing that in those days the reading of the cuneiform characters had not attained to the existing knowledge, and so Sir Henry Layard and I tried, with the little money we had at our disposal, to procure for the British Museum as many records of the past as possible engraved on marble and stone. I do not mean to say that we threw away any inscription found, and that we had only valued sculptured antiquities; but as we had only a certain amount to spend, and so many months in which

* Assur-iddenna-pal and Assur-iddenna-palla, supposed to be Sardanapalus of the Greek and Roman legends. Hunting, it seems, was a great recreation of the Assyrian kings, because we find that at the north-west palace at Nimroud, Assur-nazir-pal, the father of Shalmaneser, is represented on the sculptures engaged in the lion and bull hunt.

† On viewing the sculptures of the lion hunt in this chamber it reminds one of the inspired words of Nahum in the 11th verse of the second chapter where it is said, "Where is the dwelling of the lions, and the feeding-place of the young lions, where the lion, even the old lion, walked, and the lion's whelp, and none made them afraid?"

to accomplish our missions, we could spare neither money nor time in clearing out all the rubbish from the different chambers which we discovered, and so we could only dig about 5 ft. or 6 ft. in front of the walls, whether sculpture or otherwise, so as to allow space for the workmen to pass each other unhindered. Since then there has been so much interest evinced in this branch of archaeological research, especially since the Creation and the Deluge tablets were deciphered, the Trustees of the British Museum have been most anxious to obtain an additional supply to the already existing collection, particularly in completing the tablets which are considered most interesting to Biblical study. On this account I was sent to Mesopotamia again by the British Museum authorities in 1877; and though my first attention was directed towards the above object, nevertheless I could not content myself with that stale occupation of merely examining the already-discovered palaces, but I endeavoured to try other new localities, where my efforts proved successful. Now we do not only clear out all the chambers of the *débris*, but actually break down every wall, in search for records, because it happened that both in the palace of Sennacherib and that of Assur-bani-pal we found cylinders buried in the solid brick walls, which were placed there evidently by the king's command, to preserve them from destruction in case of fire.

31. The first time I began to consider it necessary to examine all the walls of the Assyrian chambers, was, when I discovered, by a mere accident, one of the afore-mentioned cylinders recording the annals of Sardanapalus buried in a solid wall about ten feet from the lion-hunt room of the same king, which I discovered no less than twenty-five years before. I was that day going to Nimroud to look after my other excavations there, but before I proceeded thither I went to see how the work was progressing at Koyunjik and also to give directions for future proceedings. When I was leaving, the overseer superintending the work at that mound asked me whether he was to cover a remnant of a broken wall with the *débris* they were clearing out or have it removed first. I told him, most fortunately, that as we were clearing every part of the palace he might just as well pull down that remnant of a wall too, and it appeared that I had not gone away two hours before we were rewarded by the discovery of this valuable relic.

32. The Kings of Assyria, it seems, had a wise plan of building within the bottom part of the solid walls of a palace the official record of their reign; and, generally speaking, they

had a number of copies made of the same history, and buried the objects on which they were written in different parts of the building, in order that if the palace were burnt down the Royal records would be preserved. Had this cylinder and many others not been thus secured they would doubtless have met with the same fate as others whose pieces are found scattered all over the different palaces and also in the fields. These historical cylinders are of different sizes and shapes; some are divided into six, eight, or ten sides or panels, and some are oblong, but the one I found in the palace of Sardanapalus was the largest that has yet been discovered. Other records, such as astronomical observations, invocations or hymns, legends, contracts, and official deeds, were impressed on different sized terra-cotta tablets the same as the Creation and Deluge ones. The arrowheads, or characters, must have been impressed by a small wedge tool before the terra-cotta objects were baked, and the characters are so beautifully and exactly formed that one would think that the whole was done by one stroke of a stamp. It must be very pleasing to the Christian as well as the student to find that both sacred and profane histories have been very much verified by the discovery of these records on terra-cotta and other Assyrian writings. We read in Ezekiel, who prophesied on the river Chebar (Khaboor), that he was commanded to take a tile and lay it before him and pourtray upon it the city, even Jerusalem; and we are also told that Calisthenes was informed by the Chaldean priests that they kept their astronomical observations on bricks baked in the furnace.

33. I had a great difficulty in digging out these historical relics, because, before I could penetrate to the bottom of the chambers where these objects were found, I had sometimes to dig through 30 or 40 feet of débris, which had accumulated since the destruction of the buildings by modern occupiers of the mound and different explorers. Since I undertook the last two expeditions I worked on systematically, by either throwing away the rubbish far away from the site I intended to excavate, or having a few chambers cleared out altogether without even leaving a wall, and then worked round the heap in the centre. By this method there is no fear now of wasting our time or money, or losing any relic which might have been missed in the removal of the rubbish from place to place as was done formerly.

34. The excavations at Nimroud, generally speaking, are not very deep, as they are at Koyunjik; because in some places at the former mound we had only to dig 1 ft. or 2 ft. and

come upon the top of the buildings, while at the latter place we were obliged sometimes to excavate down 20 feet ere we could come upon any sign of ancient remains. In one case, where I discovered the Assur-nazir-pal's obelisk, which is now in the British Museum, I had to penetrate into the ground 35 feet before I came upon Assyrian remains. The discovery of this obelisk and the large Sardanapalus cylinder makes me very often wonder how an explorer might miss a most valuable record of the past by merely digging a foot or even a few inches from either side of it; and this fact leads me to hope that before England abandons the researches in Assyria and Babylonia altogether, where she has been so marvellously successful in her explorations, she will have the mounds of Koyunjik and Nimroud laid bare, that is to say, have them thoroughly examined, by beginning at one end and finishing at the other. I feel confident that if the work were continued for the next hundred years, in the same style in which we have been carrying it on for the last thirty-five years, still, at the end, we might, perhaps, miss a relic which would be most invaluable to both religious and scientific research.

35. The discovery of the bronze gates at the mound of Balawat, about nine miles from Nimroud, which has created so much interest in England and elsewhere, is a proof of what I have said. This mound has been used as a cemetery from time immemorial by the Mohammedans, and most likely by the Sassanians before them; and I do not believe there is a space of 2 feet in all the mound where a grave had not been dug to the depth of 5 or 6 feet; and yet for all this long period no one happened to hit upon that monument, as it was buried between 5 and 16 feet below the surface of the ground. Most fortunately, the upper part of it was only 5 feet below the surface, and thus the pickaxe of the grave-digger, after the lapse of more than 2,500 years, came in contact with the metal of this rare object which stopped his progress, and he, thinking it to be the pioneer of endless treasure, had no scruple then to think more of the living than of the dead. He took out what he could of the bronze for sale, and made it appear to the mourners that that was unhallowed ground for a true believer to be buried in. Of the pieces which were dug out, two were sent to me to England as a present, and this led me to search for the rest when I went out to Assyria two years ago. It is most astonishing that with so many explorers and eminent savants who must have often passed that mound, no one thought of digging in it until by a mere accident of opening a grave I was led to have it explored, and brought to

light the illustrated history of the conquests of Shalmaneser. There are, however, two good reasons why the mound of Balawat was left untouched by us for so long a time when we never lost an opportunity of trying every good-sized artificial mound that we saw or heard of. The first was its insignificance, for it could scarcely be seen from any great distance, quite unlike the huge mounds of Koyunjik, Khorsabad, and Nimroud ; the second, that the sight of so many graves on the top of it would naturally debar any attempt being made to disturb it without feeling sure that it contained Assyrian remains. Had the gravedigger not hit upon this object in 1875, it is quite certain that these gates, which are now in the British Museum, would have been at this time lying buried under the graveyard of the Shabbak Koords.

36. These bronzes appear to have covered a two-leaf cedar gate about 20 feet square by 4 inches thick ; and as the wood has quite rotted away, we could only find out its thickness from the bend of the nails that were found fixed to it. The scrolls or sheets of bronzes I found did not cover the whole wooden frame, but between each of the scrolls there must have been some ornamental woodwork or some precious metal of which the monument was stripped when the Assyrian monarchy began to decay. The illustrations on this monument, which are of bas-reliefs in repoussé work, are minute in detail and elegant in style, and represent the battle-scenes, marching order, and religious ceremonies of the Assyrians. Each plate is divided into two tiers, and surrounded by a large number of rosettes, which answered two purposes, of ornamenting and encircling the top of the nails that fastened the metal to the wood. This trophy is so much corroded and broken that a good deal of labour has been spent on it to have it renovated and put together ; but it is hoped that under the good management of Mr. Ready, of the British Museum, the most accomplished restorer of such damaged monuments, the public will ere long be able to see it and examine the variety of subjects depicted thereon. It affords many representations which had not appeared before in Assyrian bas-reliefs, and the most curious are the pontoons thrown across a river, the mode of the Assyrian worship, and the way they performed their sacrifices.

37. It seems from the different representations on the bronzes, that the Assyrian kings acted on some occasions as high-priests, and their sacrifices were chosen from the kine and sheep, and the mode of killing the animal was by stabbing him with a dagger through the heart. There is one scene, differently understood by two Assyrian scholars, as either at Nahr-el-Kelb,

near Beyrout, or at Lake Van, where the Assyrian priests are represented as offering a bullock and a ram as a peace-offering in front of a tablet or stele of an Assyrian king hewn in the rock, and two attendants are in the act of throwing joints of meat into the sea, which may be an act of adoration or propitiation to the sea ; but there are two monsters represented in the water in the act of devouring the flesh which is thrown to them ; one looks like a hippopotamus, and the other an alligator, which fact throws doubt on the supposition that the water represented on the plate is either the Mediterranean Sea or Lake Van.

38. Within 15 feet of this gate I found another one, about half the size of the above ; but this has been greatly damaged from corrosion, and I fear that with all the care Mr. Ready will, I am sure, lavish upon it, he will scarcely be able to restore half of it. From all that can be seen of the illustrations upon it, it seems that all the subjects represent hunting scenes and domestic amusements ; and instead of the plates being divided into two rows of figures, as they are on the large gate, they only consist of one, but the designs are larger.

39. At Balawat I also found a temple dedicated by Assurnazir-pal, the builder of the north-west palace at Nimroud, to the goddess of war, wherein I discovered a marble coffer, with two tablets of the same material therein enclosed, covered with inscription. They begin with the pedigree of that king, and relate his conquests. Then they give an account of the erection of gates of cedar-wood overlaid with copper to adorn the temple. At the end of these tablets there is a curious invocation made to Istar, the goddess of war and battle, against those who would see them and desecrate them by removing them from their place ; and as I was the guilty party, I fear that I have fallen under their condemnation ! *

40. The religion of the Assyrians and Babylonians has always been a great mystery to me, and unless some further discoveries are made in connection with Assyrian and Babylonian history which might throw more light upon the subject, we have to trust to mere theories founded on doubtful autho-

* The literal translation of this quaint orison, according to Mr. Ernest Budge's rendering, is as follows :—"Whoever (this) tablet shall see and sins many shall speak, O goddess Istar, lady of war and battle, his weapons then thou breakest, his throne then takes from him. Whoever (this) tablet shall see and (?) remove, altars shall cleanse, a victim shall sacrifice, to its place shall restore (it), Assur the lord great, his prayers shall hear, in the battle of the kings, (in) place of meeting (approaching), the thought of his heart (courage) he shall cause to find (it) ?"

ties. I believe that the Assyrians and Chaldeans and all the children of Shem believed in the existence of one over-ruling power, but acknowledged him by different attributes, and at intervals neglected the worship of the Creator for the love of the creature. Let us take the family of Abraham as an example, and see how, with the exception of the Patriarch himself, who "believed in God, and it was counted to him for righteousness," not forgetting Lot, they all possessed idols which they no doubt worshipped and adored. Firstly, we find, when Abraham sent Eliezar his steward to Mesopotamia, to the family of Nahor, to take from them a wife unto his son Isaac, both Laban and Bethuel his father, the nephew of the Patriarch, avowed the existence of Jehovah; but we find afterwards, when Jacob went to that family on the same errand for his own espousals, the belief in the true God was mixed up with idolatry. In one place Rachel calls upon the name of the Lord, and in another we find her setting her heart on her father's idols and taking them to herself. It must also be believed that if the Ninevites had not really acknowledged the omnipotence and over-ruling power of God, the prophet Jonah would not have been sent to call them to repentance.* Secondly, let us notice the striking constant rebellion of the Israelites, how they from time to time forgot the divine truth, and imitated their heathen neighbours in the worship of false gods, and in the very presence of the Almighty, so to speak, provoked Aaron to make them gods; and from time to time afterwards they forsook the true worship of Jehovah and adored the images of the heathen, and actually "sacrificed their children to idols, and they did according to all the abominations of the nations which the Lord cast out before them." We also know that until the birth of the twelve Patriarchs, the Holy Land was only promised to the children born of Chaldean mothers; and both Abraham and Isaac particularly prohibited their children from taking unto themselves wives from the land of promise, whose people had been cursed through Canaan; but they were to marry from the family of Nahor, who was blest through his forefather Shem. How truly and literally that wonderful prophecy of Noah has been verified through the offspring of his three sons, Shem, Ham, and Japheth! Have not the Canaanites lived under the curse, and suffered utter annihilation for their awful vices and wickedness, fulfilling the prophetic

* It is an extraordinary fact that the Assyrians or Chaldean Christians up to the present day commemorate the repentance or "supplication of the Ninevites" by fasting and prayer for three days every year.

denunciation of Noah, who said, "Cursed be Canaan ; a servant of servants shall he be unto his brethren" ?

41. Then it was said: "Blessed be the Lord God of Shem," by which we understand that Noah blessed God in the seed promised to Abraham, on whom was bestowed the inheritance of both the earthly and heavenly Jerusalem, as it has been fulfilled in the possession of the former by the Israelites, and the free entrance into the latter through the blood of his descendant the Saviour of the world.

42. Of Japheth it was decreed that God would enlarge him, that is to say, make him great both in possession and power, and that he would "dwell in the tents of Shem." There is no prophecy in the Bible, to my mind, which has been more forcibly, and so truly and wonderfully fulfilled as this ; and I only wonder that anyone reading these passages and comparing them with what has been taking place for the last 2,500 years, after a lapse of forty-three centuries, could ever doubt the inspiration of the Pentateuch ; but the fickle and carnal mind of man would rather believe an imaginative argument of a fellow man than trust to mere sacred truths. The descendants of Japheth, represented by the Romans, Greeks, Medes, and Tartars, have been holding under their sway not only the Holy Land, but all the country which was formerly governed by different descendants of Shem, namely the Assyrians, the Arameans, the Chaldeans, and the Arabians ; and even now, when the Turk is reviled and detested, not only in Europe but in Asia, he occupies the dwellings of Shem, and to reform or dispossess him of this sway requires more than the human brains of the greatest statesmen in Christendom can accomplish.

43. I must now say a few words about the structure of the Assyrian buildings, and how I believe the *débris* accumulated over them. I have often been asked by different people about this, and even after I tried to explain to them my theory I did not feel quite satisfied at the end with the opinion I had formed on the subject. The general idea is that the Assyrian palaces consisted of one story high without any basement ; but, from my personal observations of the different erections, I believe that most of the Royal edifices consisted of at least two stories. Even if we allowed the brick walls above the sculptures to have been 10 or 15 feet high and 5 or 6 feet thick, there would not be material enough to fill in the space between the walls of the large saloons and halls, especially the open courtyards, which are sometimes from 100 to 150 feet square, and when we consider that in some instances we found the earth that covered the ruins was about 10 feet above them, it is more

than probable that there were other buildings on the top of the one which was found buried below them.* The late M. Place, who excavated at Khorsabad for the French Museum, was of the same opinion, and in the interesting work he published he explains his theory by elegant plans and drawings.

44. It is believed, on the authority of Greek and other historians, that when the last Assyrian king, supposed to be Saracus, was besieged at Nineveh by Nabopolassar, the father of Nebuchadnezzar, he shut himself in one of his palaces, which he set on fire and perished therein with all his family about 625 B.C.,† so when the lower or ground story was burnt down the upper one fell into it, and since then rain and sand-storms and future occupiers of the place made the mound look as if it had been a natural hill. The nature of the rubbish and walls led me to this conjecture, and thus I believe that most of the Assyrian palaces were two stories high. The first story or ground floor was panelled with plain or sculptured slabs, engraved after they were built in, with walls to support them of sun-dried bricks varying from 4 to 5 feet in thickness. The second story must have been built entirely of sun-dried bricks plastered or painted over with hunting scenes or martial representations. It may be urged that the lower story could not have been supplied with daylight when there was another story above it; my answer to this objection is, that the outer rooms or halls might have been lighted through apertures or windows in the outer walls, and that the inner rooms, like those in which Sennacherib deposited his library, had no separate light, but were merely supplied by the reflection from the outer rooms, or it might have been that those rooms had no other building above them, and they were lighted by means of skylights. However, be it as it may, I feel confident that it was quite impossible that the whole of the Assyrian palaces could have been filled up to such an extent from the mere falling in of the upper part of the walls and the roofing.‡

* It is impossible to look at the rubbish heaped over the palaces of Assyria without calling to mind the words of the prophet Nahum, "And I will cast abominable filth upon thee, and make thee vile, and will set thee as a gazing-stock."

† It is also related that the conqueror completed the utter destruction of that magnificent Assyrian capital by levelling the great walls and delivering the whole city to the flames. This destruction by fire has also been prophesied by Nahum and wonderfully fulfilled. He says in ch. iii. 15, "there shall the fire devour thee." In which of the palaces Saracus destroyed himself it is impossible to tell, but most probably he took refuge in Sennacherib's palace at Koyunjik, as it must have been the most impregnable of all.

‡ Herodotus, in his account of Babylon, mentions that the houses in that city were built three or four stories high.

45. It may be that after the destruction of the Nineveh palaces other occupiers of less refined tastes levelled the hateful sites and erected their dwellings on them, and thus the brick buildings accumulated from time to time on the top and made the Royal residences look like a mass of rubbish. This is shown by the Sassanian and Arab ruins which were found in the palace of Assur-bani-pal and Kala-Shergat. Indeed, at the former place, it is shown that other people who occupied that site made some show of modern architecture by using stone and plaster with pillars to adorn the exterior part of the building. Unfortunately these superstructures have also been so much destroyed that I could not trace the general plan of the building, because undoubtedly both the people of Nebbi Younis and Mossul had been digging for stone and marble from time immemorial for their own purposes, and nothing but the depths of the Assyrian structures saved them from utter demolition. I believe that more than one-half of Assur-beni-pal's palace was destroyed by the Sasanians in digging for stone, as they were too indolent to obtain it from the stone and marble quarries which are abundant around Koyunjik and Mossul.

46. It is quite marvellous how the different prophecies have been truly fulfilled with regard to the destruction of the great Biblical kingdoms, and I cannot but feel surprised and pained at the scepticism of the day, and wonder what greater proof can be looked for than to follow the prophets in their different denunciations against the ungodly, and see how literally every inspired word has come to pass even on the disobedient people of God. The time of reconciliation has not yet come, and when God through His mercy vouchsafes His forgiveness that once-blest land will again "flow with milk and honey."

47. The site of the city of Nineveh has never been forgotten in the country, because both tradition and historical records point out Koyunjik and Nebbi Younis as the spots where the capital of the old world stood. Nebbi Younis (which means in Arabic "Prophet Jonah,") is the mound within half a mile of Koyunjik, contains a mosque dedicated to that prophet in which is shown the shrine of Jonah. It was formerly a Chaldean church, but like many other old churches in Asiatic Turkey they were preferred by the indolent Mohammedan conquerors to convert into mosques rather than to go to the expense of building new ones. Though this mound is generally called Nebbi Younis, after the prophet Jonah, officially it is still called "Nineweh," and this I learnt when I wanted to make some excavations there, and had to enter into an agreement

with the guardians of the mosque to allow me to do so, as all the land belongs to it. They merely mentioned the word "Nineweh" in the document, and when I asked them for the reason of omitting the common name of "Nebbi Younis," they said that that was the only legal name they could use.

48. I had great difficulty in digging in that mound, as it is reckoned a sacred place by all Mohammedans; but as the guardians of the mosque were my personal friends, and possessed immense influence amongst all classes of the community, they assisted me in managing the affair legally and satisfactorily against the religious prejudices and fanaticism of the lower classes. The great difficulty which had always been experienced formerly in trying to dig in that mound was in persuading the landlords to let us buy their dwellings, because all the mound is either covered with tombs or private houses, and those who were disposed to sell were afraid either of the inhabitants of the mound, or were prevented from doing so by religious scruples. However, I succeeded, not without much trouble and opposition from the local authorities, in opening a few trenches in different parts of the mound; but as the time of my return to England was drawing nigh, I was unable to make extensive excavations. I hope if I return again to that country to be able to examine that part of Nineveh more satisfactorily.

49. The Ottoman authorities explored some years ago one part of the mound, not far from the mosque, but as they do not generally carry on their work systematically and energetically they were not rewarded with any particularly good results. I myself merely found some inscriptions, and a terra-cotta tablet, unfortunately very much broken, on which is portrayed in relief an Assyrian monarch, either Sardanapalus or Esarhaddon, his father, in close combat with a lion. The attitude of both the king and the lion is so beautifully sketched out, and their limbs and muscles are so spiritedly marked, that it gives one pleasure to spend a few minutes upon examining the clay relic.

50. The mound of Nebbi Younis is supposed to have been inhabited by three kings, namely, Pul, Sennacherib, and Esarhaddon; but from the annals of the latter king we learn he had built a palace "such as the kings, his fathers who went before him, had never made," and which he called "the palace of the pleasures of all the year." According to this statement, the climate of that country must have been quite different from what it is now, because the heat of summer at the present day is so intense that no one in his senses can

spend at that spot the summer months with any feeling of pleasure, especially as there are very pleasant and delightful nooks within thirty or forty miles of Nineveh, where the kings of Assyria might have had an enjoyable retreat in the verdant valleys of the Assyrian mountains.

51. It may not be out of place here to mention what Moslem authors and their prophet Mahomed say regarding the mission of Jonah to Nineveh. In the 37th chapter of the Koran it is written : "Jonas was also one of those who were sent by Us.* When he fled into the loaded ship, and those who were on board cast lots among themselves and he was condemned ; and the fish swallowed him, for he was worthy of reprobation, and if he had not been one of those who praise God, verily he had remained in the belly thereof until the day of resurrection ; and we cast him on the naked shore, and he was sick ; and we caused a plant of gourd to grow over him ; and we sent him to an hundred thousand persons, or they were a greater number ; and they believed, wherefore we granted them to enjoy this life for a season." It is not surprising that such a mistake is made here as to the number of persons Nineveh contained, and the growing of the gourd before the divine proclamation, when we find even Josephus, who ought to have known his Hebrew Bible better, made such a blunder in his history of the Jews when he mentions that the whale which swallowed Jonah vomited him out on the shore of the Euxine or Black Sea ; and also that when he went to Nineveh "he preached that in a very little time they should lose the dominion of Asia."

52. Al-Baidhawee, an Arab historian, narrates the following story concerning the preaching of Jonah. With regard to the Ninevites, he says : "This people having corrupted themselves with idolatry, Jonas, the son of Mattai (or Amitai, which the Mahomedans suppose to be the name of his mother), an Israelite of the tribe of Benjamin, was sent by God to preach to and reclaim them. When he first began to exhort them to repentance, instead of hearkening to him they used him very ill, so that he was obliged to leave the city, threatening them at his departure that they should be destroyed within three days, or, as others say, forty. But when the time drew near, and they saw the heavens overcast with a black colour which shot forth fire and filled the air with smoke, and hung directly over their city, they were in a terrible consternation, and

* The word "Us" is used here in the same sense as in Genesis, chap. i. ver. 28, "Let Us make man in Our image," as the Moslems acknowledge the Koran to be revealed.

getting into the fields with their families and cattle, they put on sackcloth, and humbled themselves before God, calling aloud for pardon, and sincerely repenting of their past wickedness. Wherefore God was pleased to forgive them, and the storm blew over."

53. The inhabitants of Assyria consist now of mixed races, Arabs, Turkomans, Koords, Yezeedees, Jews, and Christians called Chaldeans and Syrians. The last two-named denominations doubtless belong to one nationality, the Assyrian, and they were only distinguished by these two names when they separated consequent upon the theological dispute of the age, namely, Monophysites or Jacobites, and Nestorians. These were again subdivided into four divisions through the proselytism of Rome; those of the Chaldeans who embraced Popery kept to their original name, and those who did not consent to Nestorius' excommunication were nicknamed after him; but those who separated from the Jacobites adopted the name of Syrian Catholics, while those who adhered to the Monophysite heresy they called Jacobites.

54. It is out of place here to enter into the theological disputes of those times and the diversity of opinion existing as to the right of the present Chaldeans to that ancient name. Suffice it to say, that from the time of the Chaldean or Assyrian monarchy up to to-day the name has not been lost; especially as we find from ancient history and ecclesiastical records at Rome that such people as Chaldean Christians did exist before a part of the community joined the Roman Church. It may be asked, what has become of the great Chaldean or Assyrian nation, which must have numbered at the time when Assyria was at its zenith at least 20,000,000? This can easily be answered by the fact that according to the existing rules in the Ottoman Dominions, handed down from father to son from time immemorial, when a person of any nationality embraces the faith of another denomination or creed he becomes *ipso facto* a member of that nationality. For instance, if a Christian, Jew, or Yezeedee, becomes a Mohammedan, he would at once be reckoned of the same nationality to which he joined himself, whether Turk, Arab, or Koord, and those who have seceded from their sects would feel so ashamed of having been unbelievers that they very seldom mention the name of their "infidel" parents! Even amongst the Christians in the East, if a Greek or a Syrian joins the Armenian Church, or an Armenian or a Syrian joins the Greek Church, he at once will be considered as belonging to that sect, and thus when the Assyrians or Chaldeans were

converted to Christianity, as it is supposed in the time of the Apostles, they were called Nazarenes, by which name the Christians are styled even now by the Moslem inhabitants of Asiatic Turkey, but they themselves retain the name of their different nationalities, as the case may be, and use the language of their nationality in ecclesiastical matters. Now there is no person who can be properly called a Turk, an Arab, or a Koord who is not a Moslem; nor is there a Greek, Armenian, Syrian, or Chaldean, who is not a Christian. Since the conquest of the countries commonly called Turkey and Persia by the followers of Mohammed in the seventh century of the Christian era, no Christian, Jew, or Gentile, dared change his religion and embrace another save Islamism; it is therefore certain that all the existing non-Mohammedan population of Turkey have descended from Christian, Jew, or Yezeedee parents since the promulgation of the dogma "there is no God but one, and Mohammed is his prophet."

55. The Yezedeeds, who are generally called devil-worshippers, are doubtless of Assyrian or Chaldean origin, and having mixed for so many centuries with Christians and Moslems, they have adopted certain ceremonies from both. There is no doubt they believe in the power of two deities, the good and the evil; the latter of which, who is inferior to the former, and whom we call Satan, they acknowledge to be now in disgrace, but at the end of time the good God would be reconciled to him, and give him unlimited power; and then, woe betide those who had abused him when he was restrained! Both in life and habit they resemble the Koords, and in their bravery and daring, even at the present day, when they consist of a small number, and dreadfully persecuted, they show they valour and spiritedness characteristic of the ancient Assyrians.

56. The rural Chaldean Christians, whether Roman Catholics or Nestorians, come under the same category of physical superiority over other nationalities; and it is a notable fact that what Xenophon reported nearly 2,300 years ago, when he marched with the 10,000 Greeks through the mountains of Assyria, can be repeated now with regard to the bravery of the Chaldeans, the timidity of the Armenians, and the treachery of the Koords, whom he found occupying the same country as they do now.

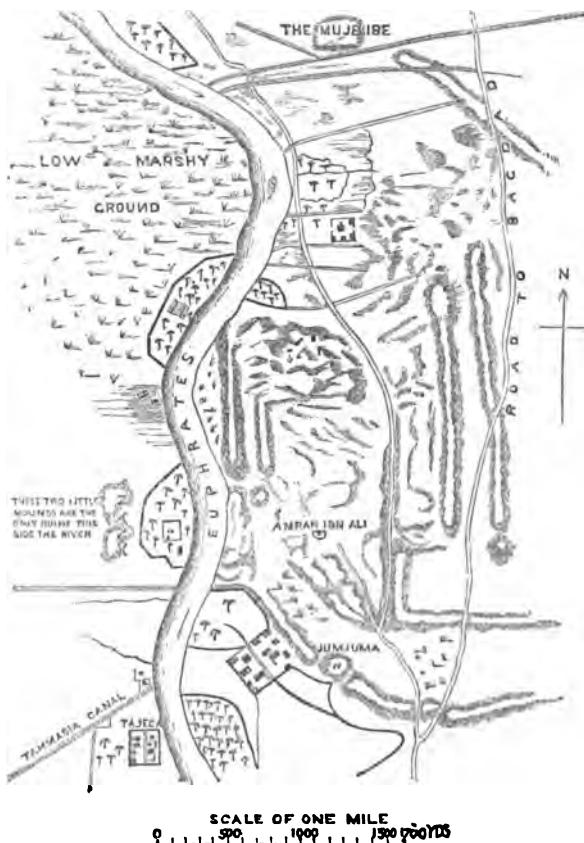
57. In my last two expeditions to Mesopotamia I had a great desire to make a few excavations at Babylon, but different causes prevented me from fulfilling my object until last February. I had been suffering from low fever the whole of the winter, and though I was not actually laid up I could not

go about much and superintend the different excavations in person as I wished. We had a most trying and unhealthy autumn and winter for want of rain, and the whole country, embracing Assyria, Irack, Mesopotamia, Syria, and Northern Arabia, was parched up; and consequently the deaths from starvation of kine, sheep, and camels, were frightful. As I said before, the easiest way to go from Mossul to Baghdad is by raft down the river Tigris, and the voyage can be accomplished in three days if the river is high, as it is generally in the beginning of spring. But when I went down to Baghdad myself last February it took me five days to make the voyage, as there was very little rise then owing to the scarcity of rain and snow during last winter in the mountains of Assyria, Koordistan, and Armenia. I have heard since that in consequence of that great drought the waters of both the Euphrates and the Tigris diminished to such an extent that all water traffic ceased for a time, and the steamers from the Persian Gulf to Baghdad had to land their cargoes in some parts of the Tigris where the water was very shallow, and have them carried to other localities, where other steamers were waiting to receive the goods.

58. Kala Shergat, which is supposed to be the Resen mentioned in the tenth chapter of Genesis, stands on the same side of the Tigris as Mossul, and the distance between them is about sixty miles. As I wished to have some work carried on at Kala Shergat during my sojourn in Babylonia, I landed there and left an overseer with a few workmen to examine some parts which I marked out for them. Both the French and ourselves had dug there on different occasions, and the last time I excavated there was in 1853, when I discovered three inscribed terra-cotta cylinders, copies of each other, the oldest Assyrian record that has yet come to light, supposed to be about 1,200 years B.C. They give an account of the first five years of the reign of Tiglath-pileser I., who is said to have been the first to organize the country of Assyria and "established the troops of Assyria in authority," that is to say, the first monarch in the history of the world who organized a standing army. Since then I have found other interesting relics; but the mound is so large, and the ruins are in such utter confusion, as if the whole mound was turned topsy-turvy, that it would require unlimited funds and considerable labour to examine it thoroughly. There are no villages near Kala Shergat, but roving Arabs who are encamping round it, and of these I chose my workmen.

59. The only point we touched at after leaving Kala Sher-

gat was Tickreet, a dirty Arab town about halfway between the former place and Baghdad. After I had spent about three days at the latter place, and arranged everything for my expedition to Babylon, I started thitherward, and reached the site of that famous ancient city in about eighteen hours' ride, only resting one night on the journey. The first object that attracts the traveller's notice on approaching Babylon is a remarkably high mound at the extreme northern border of it, called erroneously by Rich, Imjaileeba, but by the natives of the country "Babel." I, myself, believe this to be the site of "the hanging gardens," and in riding into Hillah through Babylon it is skirted on the western side.



THE RUINS OF BABYLON

60. I had in the first instance to go into the town of Hillah, where a respectable Hebrew merchant of Baghdad lent me his house to reside in during my sojourn there, in order that I might transact my business with the governor of the district with greater facility, especially as it is very central for a person who wishes to explore in different parts of Babylon. The governor was of Koordish extraction, and belonged to the old school of pashas. He had just had imported into his harem, from Constantinople, a Circassian slave-girl, to whom he was paying more attention than caring for state affairs ; at least, this was the Arab rumour in the place, but I myself did not care whether he thought more of his honeymoon enjoyment or his official duties as long as my affairs were attended to, as I was very anxious to begin work. I had to send no less than three times to his residence to inform him of the object of my mission, and my desire to commence operations at once, as I was pressed for time. Once his attendants refused to take a message in, on the excuse that he was asleep, though it was about mid-day ; then one day he pleaded indisposition, a very convenient excuse for a pasha to make when he does not wish to see a stranger ; and at last, most fortunately for him, it began to rain, which of course obliged him to remain at home for fear of catching cold ! But most luckily for me he was that day in good-humour, and told my agent, whom I had sent to communicate with him, that I might begin work as soon as I liked, and hoped that when I came in to Hillah again we should be able to meet and talk the matter over.

61. As soon as I received his Excellency's messages I started forthwith for Querich, an Arab village situated within a few yards of the ruins of "Imjaileeba," which is the site of the royal residence of the kings of Babylon, and I took my quarters in the chief's house. As soon as I had settled myself I made it known all over the village that I wanted labourers to work for me in different parts of Babylon ; and as all had heard of my intention before I left Baghdad, and knew that I had been exploring in different parts of Assyria and Mesopotamia, and had dug in their ruins before, while I was with Sir Henry Layard, my application was immediately responded to. The only difficulty was the amount of wages they demanded, which I refused to agree to, but we soon came to terms by splitting the difference ; nevertheless, after two or three days, when we got acquainted with each other, my scale of wages was accepted, and I was able after that to employ as many men as I liked for one-third less than what is generally paid in the country.

62. From time immemorial the Arabs of Hillah and its suburbs were in the habit of digging in Babylon for bricks for building purposes; and it is a known fact that Hillah, Sockashayokh, and other small towns and villages on both sides of the Euphrates, up and down the river, have been built from the materials that had been got out of the ruins of that once great city; and since the value of Babylonian antiquities became known, both Jewish and Armenian brokers of Baghdad began to bribe these Arab diggers to sell them any inscribed terra-cottas or other relics which might be found in the diggings. The labourers did this under the cover of their usual avocations, as it was contrary to law to dig for antiquities without a special order from the Porte.

63. The iniquity of carrying on this kind of smuggling cannot be too much condemned, because the Arab style of searching for antiquities is too rough to extricate fragile objects with care; and when they find them, in nine cases out of ten they break and lose a large part of them; but, worse than all, they try to make a good capital by breaking the inscribed objects and dividing them amongst the clandestine purchasers. For instance, if an Arab digger had promised the brokers to supply them with antiquities, he would not give each individual a share of what was discovered, but he would break sometimes a most valuable relic to divide amongst the different buyers, thinking that, by following this system, he would earn more money. I myself bought a valuable terra-cotta round cylinder for the British Museum when I was at Baghdad, the year before last, which had been found at Babylon and met with the same fate. The discoverer had tried to saw it in two pieces, and while doing so, the upper part broke into a number of fragments, some of which were lost. The saw that was used for that purpose must have been very rough indeed to gnaw off nearly half an inch of the inscription.

64. I have been obliged to enter into this detail to show you the great opposition I was met with on arriving at Babylon, because, naturally, my movements were watched with great jealousy by both the Arab brick-diggers and those who were bribing them to dig for antiquities. I found that I had no power to prevent them excavating where I wanted to dig myself, as it was known that the practice of digging for bricks had been allowed ever since Babylon was destroyed, and neither I nor the authorities had any power to stop such work; and to allow the Arabs to do so would curtail my operations and cause our work no end of mischief. In the first instance I managed to engage one of the brick con-

tractors to enter my service, and prevailed upon him to let his men work for me, promising him that they should have all the plain bricks they found in the diggings but all other antiquities must be made over to me. I then sent for the rest of the brick-diggers and spoke to them as to the advisability of working for me and preventing any complications occurring by digging separately themselves. I told them that I was willing to employ them, and allow them to take all the bricks that they wanted without incurring any expense themselves. This offer put them in a fix, as they found they had no excuse then to say that I was preventing them from pursuing the avocation they were brought up in. The result was that they all, without a dissentient voice, agreed to my proposal, and forthwith they went to work for me, and they have continued to do so cheerfully and faithfully ever since.

65. I learned afterwards that the poor Arabs received very little for the antiquities they sold to the Jewish and Armenian brokers. I found that what a broker asked £5 or £10 for—an inscribed terra-cotta—he had only paid the poor Arab discoverer one or two shillings. An inscribed marble slab, which was said to have been found at Kala Shergat, which a native of Mossul sold to a French consul for four shillings the late Mr. George Smith had purchased for seventy pounds.

66. The present visible ruins of Babylon consist of a section called "Babel," as already mentioned ; Imjaileeba, (the site of the palace of Nebuchadnezzar and Belshazzar), Omran, and Jimjima. The two last-mentioned localities look as if they had been occupied by the royal retinue and household. With the exception of Birs Nimroud there is nothing on the Syrian side of the Euphrates, beyond a faint tracing of some walls, to show the extent of the western limit of Babylon.

67. If anyone wants to be convinced how literally and truthfully the different prophecies about the utter destruction of Babylon have been fulfilled, he has only to visit that country and see with his own eyes the complete desolation of what was once upon a time called in Holy Writ "the glory of kingdoms." Indeed the destruction of that city was so complete that one wonders whether the accounts given of its greatness and magnificence by different Greek and other historians were not rather exaggerated ; but the words of God cannot fall to the ground, as one of the great prophets* did predict that "the beauty of the Chaldee's excellency shall be

* Isaiah xiii. 19.

as when God overthrew Sodom and Gomorrah," and again it is said,* "Babylon is fallen, is fallen; and all the graven images of her gods He has broken into the ground."

68. Nothing can be seen now of that famous city but heaps of rubbish in which are mingled, in utter confusion, broken bricks, pottery, and remnants of enamelled tiles of different colours and designs. These latter, which are only found at the kasir, or palace, are mentioned both in sacred and profane writings. Ezekiel alludes to them in the 14th and 15th verses of the 23rd chapter, and Diodorus the Grecian historian, says concerning them, "that the walls and towers of the palace were covered with tiles of different colours representing hunting scenes, wherein were shown different kinds of wild beasts with Semiramis on horseback brandishing a spear, and near her, Ninus in the act of killing a lion."

69. At the mound of "Babel" I followed the excavations of the Arabs who were digging for bricks and stone, and uncovered four exquisitely-built wells of red stone placed parallel, and within a few feet of each other, in the northern centre of the mound. They are so beautifully and scientifically built that it vexes one to see the Arabs breaking them for the sake of making lime of the stone obtained therefrom. Each well is built of circular pieces of stone, which must have been brought from a great distance. Each stone, about 3 feet in height, had been bored and made to fit the one below it so exactly, that one would imagine that the whole well was hewn in one solid rock. These wells are connected with a subterraneous arched vault communicating with an aqueduct supplied with water from the Euphrates; and even now, when the river is high, the water is seen to ooze out through the *débris* in the watercourse. These wells, which were about 140 feet high, must have supplied the Hanging Gardens with water, as they doubtless stood higher than any other building in the city.

70. I found it would be only waste of money and labour to excavate at Imjaileeba, or kasir, because from the deep ditches existing, and the nature of the rubbish which had been thrown up, I was convinced that there could be no ancient remains of any value left there, so I contented myself by having a trial at its centre for a week, and abandoned it for other localities not far distant which had not been so much turned up. These were the other ruins of the city called Omran and Jimjima, and in both these spots I was amply

rewarded for my labours in Babylon. Here were discovered what are called the contract tablets, and as the bulk of the inscribed terra-cottas were found of unbaked clay, my idea is that both the royal mint and banking establishments of Babylon were established at Omran and Jimjima.

71. The drawback experienced formerly in digging for antiquities at Babylon was the haphazard way of going about it, as the Arabs had made such a mess of the ground that it would puzzle the most experienced eye to know where to begin and where to end. However, nothing daunted, I persevered, and after a week's trial we came upon signs of standing walls which surprised the Arabs not a little; and since then, I am happy to say, our workmen have been finding, almost daily, relics of the past. Nothing of any great magnitude, I am sorry to say, has been found in the ruins of Babylon which would interest the general public to look at like the sculptures obtained from Nineveh; but for all that, what we are discovering is of the utmost value to Assyrian scholars and those interested in ancient history, especially with that part connected with the Holy Bible. In these ruins I discovered a terra-cotta cylinder, which has been deciphered by Sir Henry Rawlinson, and found to be the official record of the taking of Babylon by Cyrus while Belshazzar was revelling with "a thousand of his lords," and using at his impious banquet the golden and silver vessels which were taken by his father, Nebuchadnezzar, from the Temple at Jerusalem. The name of Belshazzar does not appear on this cylinder, because, most unfortunately, a part of it is broken and missing.

72. There is no doubt that the city of Babylon was built on the eastern bank of the Euphrates (like the city of London being on the left side of the Thames) with the greater part of the Chaldean metropolis stretching about ten miles on both sides of the "great river."

73. Both at Babylon and Nineveh all the traces of the external walls mentioned by ancient historians have disappeared, as it was prophetically foretold by Jeremiah,* but I think the separate divisions mentioned by Herodotus, with regard to the former metropolis, can be slightly traced; one on the left side of the Euphrates and the other on the right, which takes in Birs Nimroud. It is quite impossible now to trace with any degree of accuracy the inner square on the western side of the Euphrates, but traces are yet visible of the square on the opposite side.

* Jeremiah li. 58.

74. There is one fact connected with the destruction of Babylon and the marvellous fulfilment of prophecy which struck me more than anything else, which fact seems never to have been noticed by any traveller ; and that is, the non-existence in the several modern buildings in the neighbourhood of Babylon of any sign of stone which had been dug up from its ancient ruins, because it seems that in digging for old materials the Arabs only used the bricks for building purposes, but always burnt the stone thus discovered for lime, which fact wonderfully fulfils the divine words of Jeremiah, namely, " And they shall not take of thee a stone for a corner nor a stone for foundation, but thou shalt be destroyed for ever, saith the Lord."* In another place, the same prophet foretells her doom in the following majestic words, " How is the hammer of the whole earth cut asunder and broken ? How is Babylon become a desolation among the nations."† And although no less than three mighty conquerors endeavoured to restore its magnificence after its first destruction, yet they laboured in vain. The last of these, Alexander the Great, met with his death even before he could remove the rubbish from the Temple of Belus, where it is said he employed 10,000 men for the purpose.

75. At this mound, where Alexander the Great is said to have tried to rebuild the Temple of Belus, I made some excavations, which proved successful. As far as I remember, no one before me found any trace of ancient building in that locality, but I was fortunate enough to find, after one day's labour, remains of a hall connected with other chambers, wherein I found records of Nebuchadnezzar with broken pillars, capitals, and fragments of enamelled bricks, and part of a cedar beam, which are now in the British Museum. As it was not quite safe to carry on the excavations there without my personal superintendence, I was obliged, on leaving the country, to bring the work to a close in that place ; but I left a few workmen with two trustworthy overseers to continue the research in Babylon proper. Since my return to this country, however, I deemed it advisable to recommend the resumption of the work at Birs Nimroud on a smaller scale, as we have a trustworthy Arab overseer who could superintend the operations there without much danger.

76. The ruins of the tower variously named Borsippa, Temple of Belus, Birs Nimroud, and tower of Babel, rising as it were a high mountain out of the sea, struck me with greater

* Jeremiah li. 26.

† Jeremiah l. 23.

astonishment than anything that I had seen of ancient devastations, and I could not but look with wonder upon the seeming supernatural vitrification of a large part of the still standing brick piles that can be seen for about twenty-five miles around. Different travellers attribute the cause of vitrification to either lightning, or extreme power of artificial heat; but it seemed to me on examining the different masses that neither the work of man nor the common electric fluid could have caused that extent of vitrification. These huge boulders are not large lumps of vitrified bricks, like those found in the brick-kilns, but actual masonry, which had been torn down from the top to the bottom. On consulting two scientific gentlemen in this country who understand the effect of lightning upon such massive structure, I was told that electric fluid could not cause such wholesale vitrification; but as the specimens I brought with me, which they examined, were only pieces which I had picked up from amongst the rubbish on the tower, they could not quite decide as to the agency which caused the extraordinary, and apparently abnormal change.

77. I tried when I was at the Birs to break off a large piece of the huge boulders to bring home with me for examination, but unfortunately I had no tools with me powerful enough to do as I wished; nevertheless, I hope that when I return to that country this year to be able to break a good-sized piece for the purpose of examination. Benjamin of Tudela, the Jewish traveller, in writing about Birs Nimroud, says that, "the heavenly fire which struck the tower split it to its very foundation;" and I do not know why we should not believe such a phenomenon, unless it is proved convincingly to the contrary.

78. Although different travellers have visited the place from time to time, and noticed the strange, and what would seem supernatural visitation, not one of them has come to any definite scientific conclusion as to the real agency which had produced the extraordinary fusion. At the end of this paper I shall quote the different notices given by different authors upon the subject, and will leave it to those interested in this matter to draw their own conclusions therefrom. I must say that, as far as I am concerned, after having read these various accounts, I did not feel a bit wiser, but thought might not the following words of Jeremiah be fulfilled:—"Behold I am against thee, O destroying mountain, saith the Lord, which destroyest all the earth, and I will stretch out mine hand upon thee, and roll thee down from the rocks, and will make thee a burnt mountain."*

* Jeremiah li. 25.

79. After I had made arrangements for the continuation of the excavations in Babylon I returned to Baghdad for the purpose of visiting a new mound, called Tel-loh, on the Shat el-Hai, the river which runs in Southern Mesopotamia, between the Tigris and Euphrates, about 150 miles to the south-east of Babylon, where I had heard there were some ancient remains discovered. I might have gone direct all the way by land from Hillah, but I was told that the journey would be very fatiguing and inconvenient for want of provisions and habitations on the way, whereas by going to Baghdad I could go all the way by water, partly by steamer and partly by native craft. Here I could excavate for only three days, because, firstly, I could not spare the time, as I lost no less than six days on the voyage; and, secondly, I found on arriving there that Tel-loh was not included in my firman, that district having a few years back been taken from the Baghdad pashalic and added to the vilayet of Basra, which had been constituted into an independent province. However, I managed during my short stay there to dig out some inscribed objects, which have proved to belong to a very early age, somewhere about 2,000 years B.C.

80. Some French travellers had visited the place a few years back and made a few excavations there; and to show what damage can be done to valuable antiquities by allowing private individuals to dig for their own personal benefit, I will relate what took place in reference to a very old black basalt statue in sitting posture, which was discovered there some years back. The Arab who first found it cut its head off and took it away to sell, and on account of some misfortune that befell him while it was in his possession, he broke it to pieces and threw it in the river; then a French traveller cut the hands off and sold them to the late Mr. George Smith for the British Museum; and afterwards the French Consul at Basra cut off the bust and carried it away with him; and when I was there I came upon the lower part, which was covered with inscription, and had I deemed it worth the expense I might have been the fourth spoiler of what the Arabs call, "Loh, the idol of the infidels." This mound is very large, but low, and in some places we had only to dig about 6 inches and found records of the past.

81. I then returned to Baghdad, and after having sent away to England the different antiquities found at Babylon, Birs Nimroud, and Tel-loh, and made some arrangements for continuing the explorations at the former place, I started for Kala Shergat and Mossul along the western border of the Tigris.

82. In both the mounds of Kala Shergat and Koyunjik where excavations were carried on during my absence, some small objects of antiquity had been found ; and after having spent a month longer at Mossul in packing up the different relics discovered in Assyria to take with me to England, and arranged as to leaving about thirty men under the superintendence of my nephew to go on with the excavations at Koyunjik, I started on my homeward journey in the beginning of May through Northern Mesopotamia, leaving the mountain of Sinjar this time on my right.

83. I had intended on going direct west to the river Khaboor* to make some excavations in a number of mounds on its eastern and western banks which were reported to me to be of Assyrian origin. Although I saw an unaccountable number of mounds scattered on the right and left of my route I only cared about examining three or four of those which seemed to me worth digging at ; but, unfortunately, I could not find any workmen to enable me to make the intended trial, as the late drought had driven all the Arabs, who usually encamped around these mounds, further north, for the sake of pasture for their cattle and food for themselves. Indeed, provisions were so scarce in the country that I was obliged to forego a visit which I had intended to make to the supposed site of Carchemish, and for two whole days our poor animals had to feed on a scanty supply.

84. At the foot of one of the mounds on the left side of the Khaboor I found the upper part of a black basalt tablet, or stele, of an Assyrian king, which had been broken and hurled down to the bottom by the Arabs when they were digging a grave. It was too large for me to move, and having no tools to thin it with, so that it might be carried on the back of a mule, I had it buried deep in the mound where I found it, trusting to future time when I could manage to have it thinned and moved to Aleppo or Mossul.

85. My homeward route lay this time through Telaafar the capital of Sinjar, called Balad Taban, on the left side of the Khaboor, and then along its bank until we came to a ford, which is called Shareeat-Ihlala, where we crossed and journeyed then on the right bank of the said river until we reached Ibsairat† at the junction of the Khaboor with the Euphrates. We then went on to Dair, the largest town in those parts,

* This Khaboor or "Chebar" is supposed to be the river mentioned by Ezekiel, in ch. i. 1.

† This Ibsairat was supposed formerly to be the site of Carchemish.

where the governor of the district resides, and having crossed the Euphrates opposite the city and remained there two days for rest, we went on to Aleppo along the "great river" until we came to Maskana, whence we branched off for the above-mentioned city, which is only about forty-five miles from the Euphrates.

86. Maskana is a new station near the ancient city of Bales, where a military guard was established a few years ago by the Ottoman Government for keeping the Iniza Arabs in order, and for the convenience of passengers who came from Baghdad, Basra, or Hillah, by water so far up the Euphrates. The authorities have established one or two steamers to ply up and down the river as far as Maskana during the spring season, when the water is high enough to render the steam navigation safe, and of course any person who wishes to visit Aleppo from Southern Mesopotamia and dislikes roughing it could easily come up by this route without much fatigue.

87. In conclusion I must apologize for the length and, perhaps, not very entertaining account of my travels; and more especially I must crave your forgiveness for any unintended laudation of my exploits and what would seem very personal; but in relating certain undertakings and successes, a writer cannot help bringing self to the front and making his story look as if it had been drawn up for the purpose of boasting and vaunt. I must also beg the indulgence of the learned, both in theological and scientific matters, and particularly those who are acquainted with archaic research, if I have touched upon any subject which required more study than I have had time or ability to grapple.

WHAT DIFFERENT AUTHORS SAY CONCERNING BIRS NIMROUD OR TOWER OF BABEL.

"THE tower built by the dispersed generation is four miles from Hillah. It is constructed of bricks, called Al-ajur (the word still used by the Arabs for kiln-burnt bricks); the base measures two miles, the breadth 240 yards, and the height about one hundred canna. The heavenly fire which struck the tower split it to its very foundation."—*Benjamin of Tudela*.

"This tower-like ruin is pierced throughout with small square apertures, probably to preserve the fabric from the influence of damp. . . . In different parts are several immense brown and black masses of brickwork, more or less changed into vitrified state, looking at a distance like so many edifices torn up from their foundations. . . . Previous to examination I took them for masses of black rock. . . . They must have been exposed to the fiercest fire, or scathed by lightning."—*Mignan's Chaldea*.

"The most curious of the fragments are several misshapen masses of brick-work, quite black. . . These have certainly been subjected to some fierce heat, as they are completely molten, a strong presumption that fire was used in the destruction of the tower, which in parts resembles what the Scriptures prophesied it should become—a *burnt mountain*. In the denunciations respecting Babylon, fire is particularly mentioned as an agent against it."—Keppel's *Personal Narrative*.

"On one side of it, beneath the crowning masonry, lie huge fragments torn from the pile itself. The calcined and vitreous surface of the bricks fused into rock-like masses, show that their fall may have been caused by lightning, and, as the ruin is almost rent from top to bottom, early Christian travellers, as well as some of more recent date, have not hesitated to recognise in them proofs of that divine vengeance which, according to tradition, arrested by fire from heaven the impious attempt of the first descendants of Noah."—Layard's *Niniveh and Babylon*.

"It is more difficult to explain the cause of the vitrification of the upper building. My late talented friend, Captain Newbold, assistant-resident in the Deccan, originated an idea when we examined the Birs Nimroud in company, which is, I believe, now beginning to be adopted, that, in order to render their edifices more durable, the Babylonians submitted them, when erected, to the heat of a furnace. This will account for the remarkable condition of the brickwork on the summit of the Birs Nimroud, which has undoubtedly been subjected to the agency of fire. No wonder that the early explorers, carried away by their feelings of reverence, should have ascribed the vitrified and molten aspect of the ruins to the avenging fire of heaven, instead of to a more natural agency. It is worthy of notice that in several places where vitrified bricks occur in Babylonia, they are associated with a tradition that Nimrod there threw the patriarch Abraham into a furnace. There appears, therefore, to be some grounds for Captain Newbold's suggestion."—Loftus' *Chaldaea and Susiana*.

"At the foot of this tower-like mass lie great boulders of vitrified brick-work, which were evidently fused by fire, from heaven or elsewhere, and hurled from the original summit of the building, which was no doubt 100 ft. or 150 ft. higher. The appearance of these masses of fused brickwork very naturally led Jews and Mussulmans to conclude that they had been blasted by lightning at the time of the confusion of tongues, which put a stop to the building of the Tower of Babel by the impious descendants of Noah."—Geary's *Through Asiatic Turkey*.

The CHAIRMAN.—We are all very much indebted to Mr. Rassam for his paper, which is so full of interest; and although he has been kind enough to exert his voice, and read between thirty-six and thirty-seven pages of printed matter, the length of a paper should be measured rather by the amount of interest it contains than by any other standard. (Hear, hear.) I may say that I have heard some papers read in places not a hundred miles from here that have been much shorter than this, but which have yet seemed unreasonably long. This paper, although it consists of nearly thirty-seven pages, has not appeared to me a long one, and I think I may say the same on behalf of the majority of those present. (Hear, hear.) There is one thing on which I cannot help remarking, and that is the admirable way in which

Mr. Rassam has drawn out the very point which we, the members of this Institute, desire to have drawn out, namely, the defence of Holy Scripture. (Cheers.) In his discoveries in Assyria and Babylon he has shown the fulfilment—the literal fulfilment—of prophecy. (Hear, hear.) That, I conceive, is a very great point. We all of us know how this argument is met by sceptics. They tell us that these prophecies of Jeremiah, Nahum, and others were all written after the event. For my part, I am not so credulous as to believe that any persons could have existed who could have forged the different prophecies that are given to us in the differing styles, say, of Jeremiah and Nahum, and make them so well suit the history, not only of Genesis, but also of Kings and Chronicles, and at the same time to fit in with the present state of things as truly as they do. (Hear, hear.) I confess it appears to me—not being a credulous person—to be a more reasonable plan to believe in prophecy, than to admit that such accomplished forgers could have existed as those who are believed to have concocted such extremely clever prophecies, so accurately corresponding with facts. (Hear, hear.) I think, therefore, that the argument which Mr. Rassam continually impressed on us throughout his interesting and valuable paper in regard to the fulfilment of prophecy is a very telling one. I have thought it right to trouble you with these few observations because I could not help speaking on a matter of so much interest to us all. (Hear, hear.) I hope now that Mr. Pinches will respond to the challenge Mr. Rassam has offered, but before he does so I should state that I have just had placed in my hands a letter from Dr. Porter, President of Queen's College, Belfast (who has often travelled over, explored, and examined almost every part of Palestine, and regions eastward),—Dr. Porter expresses his great regret that circumstances prevent his being present to-night, adding that the paper is one of high value, and calculated to be of much service.

Mr. T. G. PINCHES.—I think we cannot but express our obligations to Mr. Rassam for the interesting account he has given us of his travels. That, however, is a subject on which I, of course, cannot presume to speak; but there is one point upon which Mr. Rassam has touched in his paper to which I may briefly refer. He tells us that at the end of the tablets he found in the Temple at Balawat “there is a curious invocation made to Estar, the goddess of war and battle, against those who would see them and desecrate them by removing them from their place, and, as I was the guilty party, I fear that I have fallen under their condemnation.” I think that Mr. Rassam has misunderstood this inscription, because it is said that whoever “destroyed” the tablets should fall under the condemnation there mentioned; but Mr. Rassam, on the contrary, has not destroyed them, but has been the means of bringing them to light, and thus has incurred the thanks rather than the reprobation of the monarch who erected them. Therefore, I hope he will experience all the blessings which we are told await the fulfilment of the prophecy. I may say also that I do not think from these tablets that the copper gates mentioned thereon are those which Mr. Rassam

found,* and my reason for saying so is that the material is different. Mr. Rassam's gates are of bronze. It may have been that the terms "copper" and "bronze" were confused, but still there are two distinct terms used for these metals. There were four inscriptions discovered, I believe, at Khorsabad, and each of them was written on a different metal. Each of these tablets contained the name of the substance of which it was composed, written in Assyrian, so that the names of these metals are well determined. I do not think there can be a doubt that the gates mentioned in the inscriptions were of copper and not those found by Mr. Rassam, which are of bronze.† Mr. Rassam has not told you everything about these wonderful gates, which are even more wonderful than he has given you to understand. The number of representations to be found in each band of bronze is about half as many as will be found in the whole Nimroud Gallery of the British Museum. The height of the gates was at first estimated at about twenty-one feet, but I am inclined to think that the height was even more than that, namely about twenty-six feet, while the widths of each of the two gates was about six feet, making the total width about twelve feet. There was an edging containing in duplicate an inscription of Shalmaneser which is of very great interest. With regard to the point of which Mr. Rassam spoke when he alluded to the antiquities obtained from Tel-loh, I may state that they are of very great interest, consisting mostly of cones containing dedi-

* Mr. Rassam had added, parenthetically, in the course of his lecture, that he believed the gates mentioned on the tablets were those he had discovered in the mound of Balawat. (T. G. P.)

† Mr. Pinches suggests "there is yet another, and more conclusive reason why these cannot be the gates Mr. Rassam found, and it is this : that while the tablets were deposited in the temple of Balawat by Assur-nazir-pal, the gates Mr. Rassam found were set up by his son, Shalmaneser II."

Mr. Pinches also desires to add the following remarks upon two sections of the paper :—

§ 37. That either Lake Van or Lake Urmieh is intended there can be no doubt, for the inscription which accompanies the scene tells us that it is "the sea of the land of Nairi," a country which, from its being generally mentioned in connection with the land of Urardhu, the Ararat of the Bible, must have been north of Assyria. Indeed, Prof. Schrader remarks (*Keilinschriften und Geschichtsforschung*, p. 180) that Urardhu or Ararat appears to have been considered, in the olden times, as a part of the land of Nairi, and he identifies "the sea of the land of Nairi" with Lake Urmieh, Lake Van being generally called, in the inscriptions, "the upper sea of the land of Nairi." The supposed hippopotamus and crocodile in the water are thought to be the offsprings of the Assyrian bronze-chaser's own imagination, due, perhaps, to some legend or traveller's tale.

§ 49. The clay figure of a man killing a lion undoubtedly represents Assurbanipal or Sardanapalus, and a comparison with the sculptures in the Assyrian Basement Room of the British Museum will show that it served, most likely, for the model for the Assyrian sculptor when he carved the slab numbered 107A, which shows the very same subject. They are true works of art, the clay original being, if anything, the better of the two.

catory inscriptions. These inscriptions were, for the most part, dedicated by the king, whose name is read Gudea, who reigned about 2,000 years before Christ. We are told also of another king whose name is read Lig-Bagus, and who reigned also somewhere about that period. About these kings very little, indeed, is known, and the inscriptions therefore are naturally of very great interest. The piety of the Babylonian monarchs appears to have been something wonderful. According to their own lights they were not the impious people they are generally supposed to have been by the ecclesiastical writers and most of the Biblical writers, and it should be remembered that there was a great amount of bigotry everywhere. That they were cruel is, however, very certain.

The CHAIRMAN.—Perhaps the Rev. Mr. Stern, who has recently joined the Institute, will kindly make a few remarks.

Mr. RASSAM.—Ladies and Gentlemen : Probably some of you do not know that the Rev. Mr. Stern was more than two years my companion in captivity in Abyssinia, twenty-two months of which we were in chains. He was prisoner two years before my time, when his right arm was chained to his feet, which bowed him to the ground. He also visited Mossul and Bagdad.

Rev. H. A. STERN (who was very cordially received).—I have been exceedingly pleased to listen to the interesting paper which my friend Mr. Rassam has just read. It has been my privilege to traverse almost the whole of the region Mr. Rassam has so graphically described, and I can bear testimony to the correctness of every one of his statements with regard to the country, its inhabitants, and the various difficulties the traveller has to encounter in visiting those interesting and ancient regions. I can also bear testimony as to the impression which the sight of the ruins of Babylon make upon the student of Scripture. Several times I have stood upon those ruined cities, castles, and temples which Mr. Rassam has described, and I can truly say, without the least exaggeration, that with the Bible in my hand, a kind of solemn awe has overwhelmed me as I have looked around. Wherever I gazed, whichever way I turned, mound after mound arose in regular succession, like the waves in a stormy ocean, each of these mounds containing the ruins of former greatness. I was particularly struck with the Tower of Belos, to which Mr. Rassam has referred. I do not know whether I am correct or not, but it occurred to me as I beheld that singular wall, which, shivered and torn, rises spectre-like from amidst the *débris* of buried greatness and vanished glory, how minutely the words of the prophet have been verified : "Her high gates shall be burned with fire." Indeed, standing amidst these gigantic ruins, with the Bible in one's hand, one realizes how remarkably have been fulfilled the denunciations of the prophet concerning the luxurious and sin-polluted Babylon. But I do not wish at this late hour to trespass on the indulgence of the audience ; I will, therefore, simply tender Mr. Rassam our best thanks for the interesting and instructive paper with which he has favoured us. (Cheers.)

Mr. RASSAM.—After what our respected President has stated with regard to

the fulfilment of prophecy, and what sceptics have said as to some accounts given in Scripture being forgeries, it might well be asked, how came the prophecies to be so wonderfully fulfilled? There are certain events which have taken place that no one can deny in the face of the facts I have given. In the first place, it is very extraordinary that there is certainly one-fourth of the account given by the ancient historians which is not believed in these days, and that whatever they have said cannot be corroborated except where it is affirmed by sacred history. In the second place, we know that geographers and historians, like Benjamin of Tudela and Josephus, have made great blunders, and if you take their books and go to the countries they have described, it will be found that a good deal of what they have told you is not correct. For instance, with regard to Jonah and the whale, we of course know the correctness of the prophecy concerning that event ; but suppose I were an infidel, and did not believe in the Word of God, I could not but say that the Scriptural account of Jonah is correct, but the nonsensical allegation of Josephus, that the whale vomited Jonah on the shores of the Euxine, was inadmissible, seeing that that would more than double the distance to Nineveh. I say, therefore, that it would have been impossible for any forgers to have given these predictions to us, for they never could have come down later than the seventh century before Christ. How could any forgers, then, have told us that they knew that after 4,000 years the Turks would be governing the Biblical land ; as it is well known that the Turks were Tartars who were formerly called Scythians, and admitted to be the descendants of Japhet? With regard to the destruction of different parts of Babylon and Nineveh, if I had had the opportunity of writing a longer paper I could have given proof upon proof ; but supposing I were a Chinese, I could not help believing that those so-called forgeries had unmistakable veracity stamped upon them, and have been shown to be literally fulfilled. It is really wonderful ! (Cheers.)

The CHAIRMAN.—Is there anyone present who can read the inscription on this cone (holding up a small cone that had been referred to by Mr. Rassam in his paper) ? It would be very interesting to know to what it has reference. It is a sort of newspaper 4,000 years old.

Mr. PINCHES (to whom the cone was handed).—This is a cone from Tel-loh. It contains an inscription relating to the king known as Gudea, who calls himself Viceroy of Zirgulla. The name by which Tel-loh is still known among the Arabs is, I believe, Zerghul. The cone is dedicated to a god called Nintsu, and speaks of the rebuilding of his Temple at Zirgulla. But this cone is not written, nor are any of the inscriptions of the period to which it belongs, in the Semitic language, but in a language supposed to be allied to the Turkish. There is only one word on which to base any connection, and I do not myself think that it is allied to the Turkish, though some of the grammatical forms are a little bit alike. (Hear, hear.)

The meeting was then adjourned.

ORDINARY (INTERMEDIATE) MEETING,
FEBRUARY 16, 1880.

THE REV. PREBENDARY ROW, M.A., IN THE CHAIR.

The minutes of the last meeting were read and confirmed, and the following elections were announced :—

LIFE MEMBER :—J. S. Napier, Esq., Glasgow.

MEMBER :—James E. McDonald, Esq., Blackheath.

ASSOCIATES :—Rev. J. G. Birch, M.A., London ; Abraham Hyams, Esq.,
Jamaica ; Professor S. E. O'Dell, London ; Rev. U. Smith, M.A.,
Sheffield.

Also the presentation of the following Work for the Library :—

"Miracle No Mystery." By the Rev. J. H. Barker. *From the same.*

A lecture "On the Life and Works of Professor Clifford" was then delivered by the Rev. C. Lloyd Engström, M.A. A discussion ensued, in which the following took part :—Rev. J. Coxhead, M.A., Mr. David Howard, and the Chairman. The Lecturer having replied,

The Meeting was then adjourned.

ORDINARY MEETING, MARCH 1, 1880.

J. E. HOWARD, Esq., F.R.S., IN THE CHAIR.

The minutes of the last meeting were read and confirmed, and the following elections were announced :—

MEMBER :—J. H. Salisbury, Esq., B.M.S., M.A., M.D., &c., United States.

ASSOCIATES :—Isaac Brown, Esq., F.R.A.S., F.M.S., Kendal ; W. Collet, Esq., London ; Rev. J. Joyce Evans, M.A., London ; E. Oakley Newman, Esq., London ; Rev. J. Strickland, B.D., London ; C. S. Webber, Esq., F.R.C.S., London.

Also the presentation of the following Works for the Library :—

“ Proceedings of the Royal Society.”	<i>From the same.</i>
“ Proceedings of the Royal Institution.”	<i>Ditto.</i>
“ Proceedings of the United Service Institute.”	<i>Ditto.</i>
“ Proceedings of the Geological Society.”	<i>Ditto.</i>
“ Our Inheritance in the Great Pyramid.” By C. Piazzi-Smyth.	<i>L. Biden, Esq.</i>

The following paper was then read by the Author :—

ON THE BEARINGS OF THE STUDY OF NATURAL SCIENCE, AND OF THE CONTEMPLATION OF THE DISCOVERIES TO WHICH THAT STUDY LEADS, ON OUR RELIGIOUS IDEAS. By G. G. STOKES, Esq., M.A., D.C.L., LL.D.Dub., F.R.S., Lucasian Professor of Mathematics at Cambridge University, &c.

IT is the constant aim of the student of science, who not only follows the labours of others, but seeks to extend his own researches into the region of the unknown, to refer observed phenomena to natural causes. Thus, the ocean is seen to

exhibit strange periodic movements, which have an evidently beneficial effect as tending to prevent stagnation. A study of the period of these movements shows that they have some mysterious connexion with the moon. Presently, Newton arises and shows that these movements are necessary mathematical consequences of the same law by which a stone, held in the hand and let go, falls to the earth.

As regards this particular phenomenon, it may be that the immediate effect of the discovery is rather to turn aside the mind from the contemplation of the useful results of the movement, and involve it in the intricacies of a very complicated hydrodynamical problem. The particular phenomenon is shown to be part and parcel of a vast system, and it may well be that the beneficial results of this system are not at first apparent; from its very vastness the mind's eye fails to take it in.

Yet surely the study of truth of one kind, rightly pursued, cannot conflict with our reception of truth of another kind, though from the imperfection of our knowledge and of our faculties temporary difficulties may arise. Doubtless, in the end our views will be enlarged, and in some respects, it may be, corrected.

To illustrate my meaning, permit me for a few moments to indulge in fiction. I will suppose then, that in some un-frequented part of the Pacific Ocean there existed an undiscovered island, which, for the sake of a name, I will call Irene. The Irenians were men of cultivated minds, intelligent, and deeply religious, but for centuries they had been cut off from all connexion with the rest of the world, and they were ignorant of the very rudiments of natural science. They delighted in poetry, and in the cultivation of the feelings; and being devout they contemplated the phenomena of nature in immediate relation to a supreme Being. That most wonderful of our senses, the sense of sight, buried to them in mystery in all that belonged to it, was a special object of admiration, and they loved to dwell on it as evidence of the beneficence of the Creator.

At last the island was discovered by the captain of a scientific circumnavigating expedition. The Irenians and their visitors were greatly pleased with each other; and the scientific men of the expedition, finding them apt pupils, took great interest in teaching them so much of the elements of physics as the length of their stay permitted. They taught them among other things something of optics, the existence of rays, the laws of reflection and refraction, the formation of images by lenses, the use of telescopes. They then dissected an eye,

and showed how an eye acts just as an optical instrument in forming images of external objects on the retina. At this the Irenians were taken aback. They had been used to regard the sense of sight as an immediate gift from the Creator, depending on no second causes, and now they saw part of their organs of vision acting like so much dead matter. They received a shock, at which some of them were staggered, and asked themselves the question, Is it possible that, after all, this beautiful scene around us, these trees and flowers and painted butterflies, are merely a casual result of the blind interaction of a few simple laws?

But when the expedition had sailed from their shores, and the Irenians were left to themselves, and the novelty of their new ideas had a little worn off, a more sober judgment was formed of what they had learned. It is true that human reason had broken in on what they had been in the habit of regarding as holy ground; and they had learned that up to the formation of images on the retina the eye behaves like a mere optical instrument. But how came it to pass that its parts were so strangely well-adapted to fulfil this end? the cornea smooth and transparent, and nearly spherical, yet somewhat prolate, which as we know would tend to destroy spherical aberration; the crystalline lens shaped much like the lens of an optician, yet becoming gradually denser towards the centre, in a manner that the optician cannot imitate; the iris regulating the quantity of light admitted just as the astronomer regulates the aperture of his telescope, but self-acting in a manner which the optician cannot imitate? Reflecting on these things they became overwhelmingly impressed with the evidence of design, and design must have had a designer. But they had learned to think of him differently in some respects from what they did before; to regard it as no derogation of his character to suppose that he accomplishes his ends in conformity with, rather than in supersession of, such natural laws as they can themselves investigate, and doubtless of many others which are beyond their ken.

Now the progress of science is continually placing us more or less in the condition of our imaginary islanders, by reducing to a result of the straightforward operation of natural laws processes, perhaps evidently beneficial in their effect, but which were at one time shrouded in mystery as to their nature. And it behoves us to keep our minds in a condition of sober impartiality, neither on the one hand being so carried away by the achievements of science as to forget how much there is which science holds out no prospect of ever being able to explain, nor on the other refusing to admit conclusions fairly

deducible from scientific evidence, on the ground that we had associated something contrary to those conclusions with truths which we hold it most important to maintain.

The alarm at one time felt at the conclusions of geologists that the antiquity of the earth itself, and even of plants and animals, was to be reckoned by something considerably exceeding a few thousand years, may pretty well be looked upon as a thing of the past. But instances in which scientific discoveries, or conclusions based on good evidence, run counter to our preconceived ideas occur from time to time, and are likely to occur in the future. In this connexion I would refer for a minute or two to a scientific doctrine which is now beginning to be pretty generally received, and which has, I think, given needless alarm to some who have the cause of religion at heart; I mean the doctrine of the conservation of force. I am not going to enter on any lengthy explanation of what the doctrine means; suffice it to say that for every development of work there must be a corresponding *expenditure of something*; and conversely, when work is apparently lost, its full equivalent must appear in some other shape, in quantity corresponding to the work apparently lost, and very commonly in the shape of heat. We have reason to believe that this law is no less applicable to living beings than to dead matter, and that, for instance, the work exerted by a labouring man is the equivalent of a part of the energy due to chemical combinations between the constituents of his food and the air he breathes. It is this last application of the law which seems to give rise, in the minds of religious men, to apprehensions which to me appear wholly groundless. We have long been familiar with the idea that living beings, no less than dead matter, are subject to the three laws of motion; and if we have now reason to believe that they are no less subject to the law of the conservation of force, I cannot imagine what religion has to fear from that. To aid our ideas let us adopt a rude analogy, and compare a living being to a railway train in motion. If we have now reason to regard the will, considered in relation to the exertion of muscular work, as something more nearly analogous to the intelligence of the engine-driver than to the coals under the boiler, that surely is not in any way derogatory to our idea of a living being, or of the wisdom and power involved in its first creation. Rather, as it seems to me, our ideas of what constitutes a living being tend to be refined and exalted.

If we allow the existence of,—say even if we adopt for trial the hypothesis of the existence of,—an intelligent Being above ourselves to whose Will the arrangement of Nature is due,

there are two ways in which we may draw a picture in our minds (however imperfect that picture may be) of the mode of exercise of that Will, namely (1), by a series of independent *fiats*; or (2) by adapting means to an end, and working according to established laws. Now, the ordinary course of Nature shows that such is at any rate an ordinary mode of operation of that Will; as, for example, where we see an apparatus adapted to the laws of reflection and refraction of light in such a manner as to produce images on the retina. What, then, should we expect *a priori* to find in our examination of Nature? Surely, as we must picture to our minds a skill of contrivance far beyond our own, we might expect that the greatest human intellect would be able to follow but a small portion of the contrivances actually existing; consequently, that at the boundary of what we have been able to make out there should be dim indications of something of the same kind stretching out into the unknown; but yet, at the same time, that there should be no indication that such a chain of causation would of itself alone suffice for the explanation of the system of Nature.

And this, it seems to me, is precisely what we find. To revert to our illustration of the eye: we have seen that as regards the formation of images on the retina it acts as an ordinary optical instrument in a way which we can fully follow; but when the images *are* formed, what then? We find the retina to contain an exquisitely delicate network of nerves collected into the optic nerve, and thence running into the brain. These nerve-fibres seem as evidently adapted to fulfil an end as the telegraph wires which run along a road or railway, though how they act in conveying an impression into the brain is as yet unknown; and how the impression so conveyed into the brain is capable of affecting our minds is shrouded in the deepest mystery. Again, the form and character of the cornea, crystalline lens, &c., are such as admirably fit them for their office of refracting the rays of light; but how came they to have this form and character? We perceive that there are vessels evidently subservient to their growth and nutrition, and that is pretty nearly all we can explain about it.

There is thus, as it seems to me, no inconsistency in accepting the theory of evolution as a guide in our researches, and yet rejecting it as sufficient of itself alone to explain the whole order of nature. The rejection of it as a guide, and the acceptance of it as an axiom of universal application, seem to me to be founded alike, though in different ways, upon an exaggerated estimate of the extent of human knowledge. To

say that what we cannot explain by the operation of natural causes must be directly referred to the *fiat* of the Author of Nature, and that it is presumptuous to attempt to explain it, is to measure His mind by our own, and to assert that where we are no longer able to recognise the adaptation of means to an end there contrivance ceases. To assume that because the doctrine of evolution is a useful guide in our researches therefore nothing more is required, is to perform a gigantic "extra-polation" (to borrow a term sometimes employed in mathematics); to conclude the form of a complete curve from the mere infinitesimal arc which alone is open to our observation.

The progress of science is continually bringing phenomena under the category of deductions from established laws, but at the same time it leaves barriers which it gives no indication that science will ever be able to get over; nay, sometimes it makes the existence of such barriers more apparent. This, I think, is the case with the principle of the dissipation of energy. I will endeavour to give some idea of what this principle means. Imagine a condensing steam-engine at work. For simplicity's sake, suppose the fire removed when the boiler has been well heated; make abstraction of all the surroundings; and suppose the work done by the engine to be that of turning round a paddle between fixed paddles, the fixed and the movable paddles being alike immersed in water belonging to the condenser. The engine would go on working for a time by virtue of the heat which it got from the coals before the fire was removed. The heat belonging to the steam which comes from the water in the boiler is in part conveyed into the condenser. I say in part, not entirely, even if we make abstraction of the solid materials of the engine; for a part is in appearance lost, and in lieu of it we have an exact equivalent in the shape of work done. But in the arrangement supposed this work is converted again into heat, through the friction in the water in the condenser. The upshot is, that while in different parts of the system there is a mutual exchange between energy of one kind and energy of another, the total energy of the system remains unchanged. But though this be so, the system is in a very different condition in its initial state from what it is in its final state, when the temperature has become uniform throughout. At first some parts were hot and some were cold; and it was in consequence of this unequal distribution of temperature that it was possible to convert energy in the shape of heat into energy in the shape of work, work which, though in the arrangement supposed it was expended, wasted we may say, within the system itself, might have been conveyed outside by a shaft, and turned to

useful account. But in the final state the whole system is in a condition of dead uniformity, lukewarm throughout, and no useful effect can be obtained from it.

Now this principle blocks out a supposition in which it is possible that a certain class of minds might rest content—the supposition, namely, that the present order of things has existed as it is, saving merely certain periodic fluctuations, from a past eternity. There is something so mysterious in the idea of *past* time, when considered as the seat of past events, and not merely as a mathematical abstraction, that if the uniformitarian doctrine could be scientifically maintained many minds might be content to take refuge in the mystery and inquire no further. But we are bound to face the problem of the existence of the state of things we see around us as something that had a beginning, or, at any rate, something that was preceded by a state entirely different.

There are some, indeed, who are content to take things as we find them, without recognising anything beyond the operation of natural causes such as those which we investigate, and who boldly accept the conclusion to which the principle of the dissipation of energy considered by itself leads us, that the present order of things is slowly tending towards a goal of universal death. But if this conclusion is true as to the future, the present order of things ought to be capable of being deduced in like manner from what existed at any anterior time, however remote. If our formula were general, the variable expressing the time ought to be capable of being made negative as well as positive, and as large as we please. The question therefore arises, Can we account for the existence of what we see by mere evolution from a state the most remote that science enables us to conceive, understanding by evolution the result of the operation of natural causes, such as those that we can investigate, and excluding the operation of will, unless it be with reference merely to men and animals?

There are several reasons for thinking that our earth was at one time in a molten state. There are not wanting indications of a condition more remote from the present than even this. Associated with the stars, which the telescope reveals to us in such overwhelming numbers, are those remarkable objects, the nebulae, which have long excited the curiosity of astronomers. Laplace regarded them as remaining indications of a primæval condition of matter which he supposed to have existed in a state of diffusion, and to have given rise to the stars by concentration under the influence of the attraction of gravitation. These luminous films were supposed to be portions of that diffused matter that had not yet condensed. But as telescopes

were improved in power and definition many of these objects which had formerly appeared diffuse were seen to be resolved into clusters of stars, and a presumption seemed to be raised that if several still resisted all attempts to resolve them it was only because the stars of which they were composed were so numerous within a given angular space, and individually so minute, as to baffle—hitherto at least—all attempts of opticians to construct telescopes powerful enough to resolve them. The magnificent speculations of Sir John Herschel are perhaps known to most of those here present. He regarded a nebula as something like the system composed of our own sun, and all the stars we can see with the naked eye, and even those more minute, placed at such an almost inconceivable distance that the whole subtends only a minute angle; and that the individual stars, of which the system consists, can no longer be seen individually, even with telescopes, and we merely perceive a faint gleam of light emitted by the system as a whole. But a remarkable discovery made in recent years by Dr. Huggins rather leads us back towards the ideas of Laplace. Huggins found that, quite unlike the spectra of the sun and of the stars, the spectra of most of the irresolvable nebulae consisted of a very few *bright* lines, a character which laboratory experiments show to belong to the spectra of incandescent gases and vapours. This leaves little doubt that such must be the character of the matter of which these nebulae are formed. It would seem, *a priori*, that the matter of such masses must in time condense, and thus conceivably stars might be formed. And what strengthens this conclusion is, that many of these diffuse nebulae exhibit within them stellar points, so related to them that the chances are enormously against their being merely fixed stars casually situated in the same direction, and that these stellar points exhibit spectra of the same character as those of stars in general.

Science, then, seems dimly to point to a fiery nebula as a condition of matter the most remote that we can go back to. Can we then deduce the existence of all that we see around us by the mere operation of self-acting laws from such a condition? Or to take a starting-point not quite so far back, imagine our own earth to have cooled down to a temperature at which it would be possible for plants or animals, as we know them, to have existed; can we imagine such springing into existence, so to speak, of their own accord? Or to take a still later stage, supposing such forms of a low order once to exist, have we any scientific grounds for supposing that all that is required for the gradual formation of the higher forms, including man himself, is a slow process of natural evolution?

No attempt worth mentioning has ever been made to adduce evidence of the spontaneous production of living from dead matter, unless it be with reference to low organisms whose minuteness almost baffles our means of investigation. Putrefying organic solutions are found to swarm with microscopic creatures, whose presence at first sight, and even after a great amount of careful investigation, is very difficult to account for on the supposition that they came from germs. But if the germs, if germs there be, of such creatures bear anything like the same proportion in size to the adults that they do in the higher animals, one can foresee that a full examination of the question must be beset with enormous difficulties. I think the immensely preponderating weight of evidence obtained by those who have most carefully investigated the question is, that if germs are excluded no life is found.

With respect to the answer to the second question, the weight of authority at the present day seems more divided. It would ill become me to criticise the labours of those who have worked in fields which I have not explored. Yet, looking at the thing from the point of view of an outsider, I cannot refrain from saying, that it seems to me that speculation as to the transmutation of forms has run utterly rampant. A certain amount of change yielding sub-permanent varieties no doubt presents itself to our observation, as in breeds of cattle and races of men, and it is likely enough that the same causes of variation operate beyond what we can actually prove. But, with all due allowance for such changes, is it conceivable that they could bridge over the enormous interval which separates the higher animals and man himself from some low organism?

I am no biologist, my own studies in natural science having lain in the domain of physics. But accustomed as I am to the severe demands for demonstration which in the physical sciences are made a condition of the acceptance of a theory, I confess that it is not without astonishment I have come across what seems to me the coolness of assumption with which mere speculations are spoken of as if they were established truths by many who, following in some respects in the wake of the great leaders of biological science, have not had time to acquire that vast store of knowledge which puts the mind in a condition properly to judge of the weight of evidence by which a particular hypothesis may be supported.

On the whole, while freely acknowledging the operation of natural causes, and thinking it probable that they extend far beyond the boundaries of our knowledge, and that accordingly we may seek to include the latest well-established scientific theory in some yet higher generalization, I see no

prospect of accounting for all we see around us by any such process as this. I see evidence of the operation of will and design, which cannot be eliminated even if we would wish to eliminate it ; and that which we are obliged to admit as having operated in the past may yet operate in the future, may be operating in the present.

I have said that the principles of the conservation of force and of the dissipation of energy lead to the conclusion that the present order of things is leading towards a goal of universal death. Of course, this is only on condition that everything beyond the operation of the ordinary natural laws such as we can investigate is excluded. It becomes a curious question, is there any process which we can even picture to our minds, by which, without any violation of the principle of the conservation of energy, we can conceive the distribution of energy so altered as to make it again available for useful purposes, instead of having everything in a condition of dead uniformity ? The only satisfactory affirmative answer that I am acquainted with to this question is contained in a suggestion made by the late Professor Clerk Maxwell.

Let us imagine a closed vessel, the sides of which we will for simplicity's sake suppose impervious to heat, filled with a gas in a uniform condition, and consequently at a constant temperature throughout. In the first place, what must we picture to ourselves as the state of things within the vessel ? How must we think of the gas itself ? The laws of chemical combination, embraced as they are in the atomic theory of Dalton, give us strong ground for supposing that a mass of ponderable matter is not a continuous plenum, but consists of ultimate molecules alike to one another in matter of the same kind. The laws of crystallography again seem hard to account for if we refuse to admit the supposition of ultimate minute molecules. If these exist, a gas like a solid or liquid must be thought of as a congeries of molecules. But what conception are we to form of it in relation to heat ? What is the physical picture of a higher or lower temperature as measured by the thermometer ? There is the strongest reason now to believe that heat is in fact a mode of motion ; that radiant heat consists in a vibratory movement of that medium pervading space, at least to the distance of the furthest visible star, which we call the luminiferous ether, and whose existence we are obliged to assume in order to account for, as most marvellously well it does account for, the phenomena of light. When radiant heat is absorbed by ponderable matter, we have reason to believe that it is that the energy of the vibratory movement of the ether is transferred to the ponderable matter, of which

the ultimate molecules are thrown into a state of agitation, or rather of greater agitation than before, and that it is this state of agitation that constitutes thermometric heat. According to the molecular theory of gases, which is in great measure due to Maxwell himself, and which has now received such remarkable confirmations that it may be considered pretty well established, in a gas the molecules are for the most part free, provided at least the gas be not under a very high pressure, and are moving about with very high velocities, and occasionally coming in contact with one another, or, what comes to much the same, so close as powerfully to affect each other's motion. The velocity is not the same for the different molecules, and if it were it would not remain so, for as they came casually into collision some would be so struck as to be made to move faster, and others so as to be made to move more slowly; it is only a sort of average state of agitation that remains permanently unchanged so long as the condition of the gas remains the same.

Suppose now our imaginary vessel divided into two by a thin partition, and suppose this partition pierced with a vast number of very minute holes, each large enough to let through one molecule at a time, but not much larger than that. Imagine each little hole closed by a sliding shutter, and suppose each shutter presided over by a minute intelligent creature, that Maxwell called a demon. Suppose it were wished to have one, call it the right hand, compartment of the vessel filled with warmer and the left hand compartment filled with cooler gas. This might be effected by the demons by suitably opening or closing the shutters. When a demon saw a quickly-moving molecule approaching his hole from left to right, or a slowly-moving one approaching it from right to left, he would open the shutter to let it through. When he saw a slowly-moving molecule approaching the hole from left to right, or a quickly-moving one approaching it from right to left, he would shut the shutter to stop it. Thus after a time the right-hand compartment would be filled with molecules which on the whole were moving more rapidly, and the left-hand compartment with molecules which, on the whole, were moving less rapidly than the average. If the limits of speed which decided whether they should shut or open the shutters for the molecules moving to right or left were properly chosen by the demons, the pressure would be the same on both sides of the partition, and if the partition were then conceived to be away, no alteration would take place until the molecules had had time to diffuse among one another. Meanwhile, without any change in the total

energy, an unequal distribution of temperature would have been brought about, which is an imperative condition in order that the existing energy should be capable of being turned to useful account.

I have thought it worth while to mention this curious speculation because it presents a picture, however fanciful in its conditions, of how the natural tendency of a natural law may be averted without any disturbance of the law itself, provided, and only provided, we superadd the idea of will guided by design.

The CHAIRMAN (Mr. J. E. Howard, F.R.S.)—It is now my duty to call upon you to thank Professor Stokes for his able and interesting paper. It is enough for me to say that it does credit to his high position among the highest scientific minds of the age. His remarks in reference to the necessity of dwelling upon the idea of a designer, in order to comprehend design, remind me of the intercourse I had with one of the leading atheistic minds of the last generation, who, in his declining years, spent some time in my neighbourhood, and who, I am glad to say, died a true Christian, having by God's mercy been brought from his aberrations to a better mind,—I allude to Mr. Hone, a well-known author. I remember once asking him whether, in his atheistic days, he really did believe in design without a designer :—and I may here say that I never met with a person of his views who would fairly grapple with this question ; and who would say he really did absolutely believe in what evidently bears the marks of design, and yet does not come from a designer. I cannot detail to you the answer Mr. Hone gave, because it opened out a very serious state of mind and thought, resembling what is now called Nihilism, and would lead us away from the present subject. He, however, did not believe in design without a designer, but had another explanation to give. His atheism was inconsistent with itself.

Mr. J. BATEMAN, F.R.S.—I have been much struck with what Professor Stokes has said as to the comparatively safe position of the man who, uninfluenced by pantheistic abstractions, holds fast to the belief in a personal God. I confess I think that any one who does hold fast, in the strict and simple meaning of the term, to a personal God—including, of course, the idea of a personal Creator—has nothing to fear from the atheistic or pantheistic tendencies of the age. I know not how others feel or what their experiences may have been, but as my own experience ranges over nearly seventy years, I may be allowed to say how much I have been struck by the changes in public opinion, especially in the opinions of scientists on religious questions during this period. The satirist of the last century spoke of the scientists of his time taking the *a priori* road and arguing downwards till they began to doubt of God. But the case is precisely the

reverse in the present day. Certain scientists now start with ignoring the idea of a God, and, starting thus, it would be a miracle if they ever found Him. No attempt is made to reconcile the phenomena of creation with the idea of a personal God ; on the contrary, they try to find the best explanation they can of natural phenomena without reference to any such idea. To this fact I attribute many, if not all, the crude ideas, so full of evil results, with which men vainly seek to explain the phenomena by which we are surrounded. How vain these attempts none adequately feel but those who are acquainted with the better way, and who, starting with the idea of a personal Creator, have found that the wider their view ranged the more perfectly everything fitted in. Some twelve or fifteen years ago my friend, Professor Owen, in one of his great works on Comparative Anatomy, concluded with a few noble words, in which he asserted, in opposition to the various theories which had begun to darken the scientific atmosphere, that "the highest generalizations in the science of organic bodies, like the Newtonian laws of universal matter, lead to the conviction of a great First Cause, which is certainly *not mechanical*" (*Owen's Palaeontology*, p. 451). Such an admission from a man so able and so fair as Professor Owen well-deserves to be treasured up in all our minds. For my part, without professing to be more than a tyro in science, I confess I have watched the development of all these theories with great interest, though I cannot say with much anxiety. Nay, the discoveries of science have swept away many of the difficulties I used to experience in reading the Bible. I never was able, until geology began to claim its own, to understand many of the prophetic declarations of Scripture, e.g., those in Isaiah and the Apocalypse regarding the "new heavens and the new earth," or where the Psalmist says, "As a vesture shalt Thou change them, and they shall be changed ; but Thou art the same, and Thy years shall not fail." Without the assistance of geology I should never have been able to form a definite conception of the Psalmist's meaning ; but when I found what marvellous transformations in its strata, or outer rind, this earth—and doubtless other orbs have all followed the same law—has frequently undergone, I saw at once what was meant by the "earth and the heavens" being "changed as a vesture" while awaiting that still greater and more glorious change when there will be entirely "new heavens and a new earth." If I might quote Luther, it was he who said that we now saw this earth only in its work-a-day 'dress, but that hereafter we should see it in its garments of "glory and beauty." It is only through geology that we can form anything like a clear conception of what awaits our planet *in the future*, because it is that science which alone supplies the means of comparing *the present with the past*.

Mr. D. HOWARD.—I hardly like to rise for the purpose of offering any remarks on Professor Stokes's paper, because I feel that to comment upon so valuable a contribution would, to a great extent, be diluting it. It is a paper we shall all be exceedingly anxious to read, and which we shall read

very carefully when we have it placed before us in print. I do not wish, therefore, to say anything that would tend to diminish its effect; but I must express my sense of its extreme value at the present time, and especially with regard to two points. One is as to the very interesting parable in which Professor Stokes has pointed out, in so vivid a manner, that the study of natural and scientific laws should not stand in the way of the acceptance of a belief in a Divine Creator,—that to believe that God has acted mediately is certainly no more atheistical from a Christian point of view, than it is to believe that He has acted immediately. Why we cling so much to this idea of the immediate action of the Creator is because our minds are unable to grasp the conception of creation at all, and thus we cling to what, in fact, is a negation, because, after all, the conception of immediate creation is a negation. We cling to it, not because it is the greater thing, but because it is the less. I am not desirous of expressing any opinion as to the ideas some persons have indulged in with regard to the supposed modes of creation, such, for instance, as the doctrine of evolution. I believe that the warning given to us against assuming to have been proved what, after all, is but itself a mere assumption in many cases, is one that is very much needed at the present time. And it should not be forgotten that the idea that because animalculæ are bred in putrid substances, all living things are developed by evolution, is not a new one. I was much interested in coming upon a passage which I found in a queer old book of Paracelsus, who says that a piece of serpent which was putrifying produced small worms or serpents, and therefore comes to the broad conclusion that those small serpents, if taken care of, would grow to the full size of the original, from which assumption he goes on to argue that all things are produced by spontaneous generation, especially metals. Now I really and seriously think that in saying this Paracelsus was hardly exceeding in breadth of assumption some of the theories we meet with now-a-days. What we want is patient examination accompanied by trust and confidence in what we ascertain. If we can only trust to our own belief we can afford not to make haste, and if we can afford not to make haste, the time will come when all our difficulties will disappear. One may well imagine that what happened in the time of Galileo,—it is, perhaps a rather hackneyed allusion, but it is nevertheless very true,—is true of the present day; and as we find that a belief in our views of astronomy in no way diminishes the firmness of our Christian faith or belief, why should we suppose that other modern discoveries, if they stand the test of real investigation, can do one whit more of injury to the truth than did the discoveries of Galileo?

Rev. C. L. ENGSTRÖM.—I think those who were present at the last meeting and heard me say how very reckless Professor Clifford was in stating that all scientific men who were competent to judge took up the views he had laid down, will be glad to have had this opportunity of seeing, in the living reality, one than whom we know no person in Europe stands higher as a man of science, but who does not draw from the realms of science the same

deductions as were drawn by Professor Clifford. That Professor Stokes, the successor of Sir Isaac Newton in his mathematical chair, should hold the views he has expounded, and that he should hold them not merely concurrently with his science, but that he should put the two side by side, affords to us one of the best means we have of refuting such reckless statements as those upon which I took occasion to comment. The paper read to us by Professor Stokes is a very just rebuke to the tendency of the present day to imagine that because we are subject to certain scientific laws we are practically *identical* with mere material existence. That we are most *intimately connected* with material existence is a truth laid down in the first chapter of the Bible, in which it is stated that man was made on the same day as the beasts. Surely that is a very remarkable statement. One would have thought that if, as we are told, man was made in the divine image of God, he would naturally have been put by himself, say on the sixth day, while the beasts,—the mammalia and reptiles,—would have been made on the fifth day. But for some reason, we find that man and the beasts were both made on one day, and it appears to me that here we have a statement which goes beyond anything science can lay down as to the fact of our being subject to scientific laws. There we have in the first chapter of Genesis two great facts placed side by side, namely, man's connection with nature as a natural being, and at the same time man being almost joined, as it were, to God by the fact of his being made in God's own image. There are some points in Professor Stokes's paper that I should like to notice. [The comparison used by him as to man's body resembling a locomotive, and his controlling mind or will resembling the engine-driver, is beautiful and striking, but perhaps even a better comparison in a kindred sphere may be suggested. Suppose we were to take the case of the pointsman on a railway. The pointsman moves a lever, and the result is, either that the passing train goes on safely, or that there is a frightful collision. There is, of course, a certain amount of muscular energy exercised in moving the lever, but that is not transferred to the result,—by which I mean that the movement of the lever does not accelerate or diminish the progress of the train; it simply changes the direction in which the train is proceeding. Is there not here something very much like the action of the human will? All our energy comes from the outside, if you like, but there is still the controlling will which is represented by the pointsman. Speaking more generally, it is not well for us to be always taking the orthodox side, but where we see a difficulty we should lay it fully and fairly before ourselves, because we may be sure that if it is not thus laid before us here, it will be elsewhere, and it cannot be better examined than in this place. It is with this view that I venture to criticise some statements of Professor Stokes. In the matter of the dissipation of energy, we, of course, see in the vessel spoken of in the paper no possibility of work being done inside except by means of the shutters supposed to be moved by the demons; but supposing the walls of the vessel were removed, work might be done (by all the lukewarm heat

which they had previously confined), affecting something outside that was not even lukewarm. There is another view that may be taken of the dissipation of energy. What is this dissipation of energy? It is a change; but is it not accompanied by the production of a real something? You pull a weight up to a height, and it does a certain work, so that the final result is, that an equilibrium is produced, or, comparing the universe to a clock, atoms vibrating at different paces, all come to one uniform pace. Now that this inter-action of vibrations should take place at all is in itself a something—I cannot say what, I cannot even think what it is; but it is something. Is there not a something produced which exactly agrees with that? That is to say, if the dissipation of energy be like the running down of a clock, is there not a corresponding permanent gain in the universe? With regard to the nebular theory, this idea must be met. The nebulae, or star-dust, noticed by astronomers, will, according to modern scientific views, themselves form into systems like this of ours. Well, suppose that a quadrillion of years ago this earth was in the nebulous condition, what was the condition of the present nebulous matter then? And, further, though scientific men generally regard the nebulous as the ultimate original state, we not only see that the now nebulous was once in a penultimate state, but that when this earth, still going back, was in its penultimate state the now nebulous was in its antepenultimate state, and so on. Thus, science alone finds itself lost in a hopeless "*and what then?*" In conclusion, I would urge one or two arguments on the orthodox side. Men of science hold that because a certain law—say with regard to atoms—has been verified for 200 or 300 years it should be accepted. What does this, in effect, mean? That the human mind constructs some theory, and if that theory seems to satisfy the facts connected with it, then it is laid down as a law. Now, I say there is a theory which on this principle has a claim to be regarded as a law of existence far beyond any other—far beyond the theories of gravitation, dissipation of energy, conservation of force, and all the other theories that are supposed to be true—and that is the wonderful theory of an infinite, paternal, personal Being. Why should not this be as likely to be true as any of the theories named, especially as it not only satisfies all the surrounding facts, but by its very nature it accounts for the creation? I say that that theory rests on as solid a foundation as any scientific law; because scientific laws, by the very nature of science as at present understood, do not exist except so far as they can satisfy the surrounding facts. This argument does not, of course, prove that there is a God: it only shows that He *may* exist, starting from the scientific basis. But it must be noted that, whatever matter and mind are, mind is much nearer than matter to our thoughts; therefore the above-stated theory of a Divine existence is more within our ken than that of material existence. Nor must we overlook the immense time, granting, for the sake of argument, the truth of the evolution theory humanity has had for testing and verifying the theory of Divinity, the persistent belief in which

is surely an enormous testimony to its truth. And if a belief in God seems, after all, to be most reasonable, surely a belief in the Incarnation is so also.

Rev. F. N. OXENHAM.—I should like to refer to one statement in Professor Stokes's paper, and I may add that we ought all to be exceedingly thankful to him for that paper. I desire to put a question which I assure him I do not put in any invidious spirit. Having spoken of evolution and the difficulties in its way, I understood him to ask whether we can conceive the immense leap required from the very lowest forms of organisation to the highest. I should have thought—and I am here asking for information—that no evolutionist would ask us to conceive any such leap. I always supposed their theory to be that the immense distance between the two was reached, not by one huge leap but by an infinite number of small progressive steps. I should like to make one remark on a question that has been asked by the third speaker to-night. It is this,—Why should we adopt a new mode of treatment in dealing with the material speculations which meet us now on scientific subjects?—why should we be more afraid of them, and treat them in a manner different from that in which we have treated the speculation of Galileo?—I would say there is one very obvious reason for this. Galileo's speculation started with the full admission that there was a personal Creator, and he merely wished to explain in what way this personal Creator had acted with regard to his creatures, whereas there are a number of modern so-called scientific theories that have been started with the avowed principle that there is no personal Creator, and our modern scientific friends seek to give an explanation which shall take the place of the Creator: therefore, in dealing with these modern suggestions, we have simply to deal with a theory, the object of which is to show how we may get rid of the Creator. We are not more afraid of dealing with the one set of speculations than with the other.

Sir JOSEPH FAYRER, F.R.S.—It has afforded me great pleasure to be here and listen to Professor Stokes's paper. I never heard him to greater advantage than this evening,—certainly never with greater pleasure, and I think that this Society may congratulate itself very much on the paper which he has given us. I do not intend to detain you by any attempt to discuss the very important matters that have been brought before you, but I wish to say, especially as our Chairman seems to desire that I should take part in the proceedings of this evening, how very much pleased I am to state how entirely I sympathize with Professor Stokes's views, and how thoroughly I agree in everything that he has said. I may add that when such papers are read this Society is really fulfilling the objects for which it was designed, and I feel satisfied will do infinitely more good for science than where the object of the communication is to criticise and find fault with people who, while holding certain peculiar views, hold them honestly, and who ought rather to be enlightened and instructed than to be denounced. Therefore it is with great pleasure that I have listened to

this valuable paper, and I, for one, beg to thank Professor Stokes for the information he has given us.

Rev. R. W. KENNION.—Did I understand Professor Stokes to say, that it might be that life could be produced spontaneously, but that he felt there was vast and great difficulty in coming to the conclusion that the minute and low organisms in the germs to which he referred were spontaneously produced, and that still there would be great difficulty in believing how from these germs you could arrive at the higher and superior forms of life? It seems to me that, if you once take the immense leap involved in the admission of spontaneous generation, you have a comparatively small difficulty in taking the very much higher step of going by degrees up and up, until you get to the higher organisms. I am afraid I did not correctly gather the Professor's view upon this subject.

Rev. J. J. COXHEAD.—I should be glad to have some further explanation from Professor Stokes on the question of design. This is, undoubtedly, one of the most interesting and important questions that is now submitted to the scientific mind, and it is one of those positions on which there is the greatest determination to move forward from the quarter of scepticism and unbelief. As we trace the formation of the very highest organism, we undoubtedly see that certain limbs and organs are necessary to the existence of the particular organizations which are found to exist, and, on the other hand, in the process of ages these have been found useless and that they have decayed and been lost. This is the great problem of the present day, and I have never seen an altogether satisfactory answer given to the objections on the other side. Strongly as I object to them, I object to them on utterly different grounds from the so-called scientific grounds. It is not necessary that I should explain upon what grounds I am a believer in Christian revelation, but, at the same time, those grounds do not rest, in their first foundation, on principles of scientific theology. It seems to me that these kinds of truths present themselves to the human mind in different ways, according to the different classes of mind. There are some people who cannot see the necessity for what we call design, whereas others, as strongly, are unable to conceive how it can be that design should not exist in the universe.

Rev. S. WAINWRIGHT, D.D.—No one has yet drawn attention to one or two points in Professor Stokes's paper which I think demand some notice. I was particularly interested when Professor Stokes approached the point at which he put this question tentatively—is it a credible hypothesis, or is it hypothetically credible, that you may take the nebular theory as it has been laid down? In dealing with this it is necessary to see how it was in the first instance regarded by Herschel, and then how the whole theory previously entertained was blown into space by the first look through Lord Rosse's telescope, when it was seen that the nebulae were not nebulae, but were resolved into clustered stellar points; while, since then, as Professor Stokes states, through Dr. Huggins's discoveries by means of the spectro-

scope, we have been, to a great extent, led back to the notion that formerly prevailed as to the nebular theory, of which there are some half a dozen varieties. I for one never contest points of this sort if they seem probable. Let it be accepted that some form of the nebular theory has not yet been established, but some day will be,—nay, let us treat it as if it were established, and that we had to adjust or review our ideas of creation in accordance with it. After all you have gained nothing, you have established nothing in contradiction, on the ground of revelation. All you will have arrived at will be some indication of the way in which the various globes have been formed. The Bible says nothing about it, but that there was some one who created the *materia prima* out of which the stars were made ; that in the beginning God was. Take any of the atoms that are non-living, and which the nebular theory has to assume. You get them subject to certain laws of condensation and rotary motion, and you find them throwing off outer rings until you get an earth and various planetary relations ; but when you have got it you have got nothing that ever did live or that ever will. But the world we live in is not one of that sort. Here you must come to something beyond the nebular theory, and if you get in one case a world in which there is a moisture, and sea, and sky, but not a fragment of moss or lichen, while, on the other hand, you get a world in which there has come to be a little bit of vegetable fibre, although it be not more than an inch in length, there is between those two worlds a chasm which is to be measured only by infinity. You have here the evident design of God ; that He has done this ; that you have something you have not got in your laboratory ;—something no man can produce, and that if you say God does not exist it is necessary for you to invent Him. You are bound to assign a cause adequate to the production of the effect. Look at these gases ! They will not combine except in a certain way. The late Clerk Maxwell, who probably knew more than any other man now living on this subject of atoms and original molecules, has told us that the primary atoms bear all the marks of a manufactured article. I remember Dr. Carpenter writing to the *Athenæum* and dealing with the theory that, under certain conditions, from mud and slime and ooze, you could produce the living from the non-living. But Dr. Carpenter says,—let every condition of electrical or chemical or other force be granted, still the production of the living from the non-living is not probable ; and he adds, with our present knowledge on the subject it is absolutely inconceivable. Dr. Carpenter is admitted by Mr. Darwin to be one who probably knows more than any other on this subject, and I say that, for the creation of the original atoms, for the creation of the manufactured article, you may have got your world of atoms, but you have nothing that can live ; but when you get a vegetable fibre you have got something which is wholly different, something due to an unknown force, and I ask, what is it that makes that fibre grow ?

Capt. F. PETRIE.—I am sure I am expressing an opinion which will be

echoed by our members and friends at home and abroad, when I say that this paper must be regarded as being one of the most important ever brought before the Institute. It is eminently a scientific paper, by one in the very highest rank of scientific men, which tends to show "that there is no discrepancy between the book of Nature and the book of Revelation, if rightly interpreted." In the present day there are some few men of science, and many quasi-scientific men, who seize upon questions of philosophy or science said to militate against the truth of Revelation, and who use such in the most unscrupulous way to undermine the faith of the world. We hear of their publications, generally written with this purpose, many issued under the auspices of Secularist societies, reaching readers in every clime.* One of the main objects of the existence of the Victoria Institute is to stay this evil; to examine these questions of philosophy and science in a careful and impartial manner, and to give the results to the world. Such work in the cause of truth claims the highest talent that the Society and its friends can bring to it.

Professor STOKES.—Considering the lateness of the hour I will say but a few words. With regard to my illustration of the possibility of conceiving, in the manner shown by the late Professor Clerk Maxwell, the redistribution of energy, I should observe that the matter contemplated was thought of as contained in a vessel merely for the sake of clearness of conception. In application of the illustration, the contents of the vessel are supposed to represent the universe in the supposed ultimate condition to which it tends as a result of the dissipation of energy. One of the speakers asked me whether I contemplated a leap, at one bound, from a very low organism to a high one? It certainly never entered my head to do so. That is not what evolutionists suppose; on the contrary, thousands and millions of years have passed during which, as they say, these changes from one form to another have taken place with exceeding slowness. What I meant was, that I did not think that the minor changes of form of which alone we have any experimental evidence, such as those of varieties of animals or plants in what are deemed the same species, gave us any warrant for assuming, as a thing even probable, much less established by a fair amount of evidence, that the enormous interval which separates one of the higher creatures,—say man himself,—from some low organism, was, in fact, bridged over in the past by a succession of such changes. I was also asked whether I meant to say that I allowed the existence of life as springing from dead matter, and merely said I could not imagine the higher creatures as springing by the mere self-action of matter, even though organised matter of some low form were thus created. I certainly did not say I accepted the production of life from dead matter, but, on the contrary, expressed it as my opinion that the best experimental evidence

* The Indian and Colonial press is also now much used by these societies.

on this difficult subject went the other way ; but I did mean to say that even supposing that to be the case, for argument's sake, I could not accept the production of a higher form from mere molluscs or anything of that sort. I think there are insuperable difficulties in the way of those who would maintain that all creatures, the highest—man himself,—included, were produced from inorganic matter simply running into form of its own accord. As my mind is not of a metaphysical, but rather of a practical cast, I have not gone into the metaphysics of the question as to design in the existence of mathematical truths and things of that sort. The way in which I look on design is very homely. I regard it much in the same way that was mentioned long ago by Paley in his *Natural Theology*, when he spoke of the difference between a man's impression in picking up a stone on a common and in picking up a watch. Possibly the man would merely say with regard to the stone that it had been there for ever, but he would not say the same of the watch. With regard to one expression in reference to the molecules having all the stamp of a manufactured article, I should state that when Professor Clerk Maxwell used that expression, he quoted it, if my memory serves me rightly, as a saying of Sir John Herschel's. He adopted it, of course, but it was a saying of Sir John Herschel's. There are some other points, but as it is already so late, I will not dwell upon them, as I should only be wearying you.

The meeting was then adjourned.

ORDINARY MEETING, MARCH 15, 1880.

J. E. HOWARD, Esq., F.R.S., IN THE CHAIR.

The minutes of the last meeting were read and confirmed, and the following elections took place :—

MEMBER :—J. F. Bateman, Esq., F.R.S., London.

ASSOCIATES.—General Sir G. Malcolm, K.C.B., London ; Rev. G. Blencowe, Sheffield ; Rev. R. Phair, Canada ; E. Skinner, Esq., M.R.C.S., Sheffield.

The following paper was then read by the Author :—

*ON THE EVIDENCE OF THE LATER MOVEMENTS
OF ELEVATION AND DEPRESSION IN THE
BRITISH ISLES.* By PROFESSOR T. McK. HUGHES,
M.A., Woodwardian Professor of Geology, Cambridge.

IN the course of some remarks made by the Duke of Argyll upon a paper which I had the honour of reading before this Society upon a former occasion,* his Grace said, “I wish the attention of geologists were more directed to the question connected with the admitted fact of sea-gravels at a high elevation on our Welsh and Scottish mountains.” In consequence of which remark I was asked to put together such observations upon this subject as I had made myself or could collect from others, and communicate them to the Society.

* The title of the paper (read March, 1879) was, “The Present State of the Evidence bearing upon the Question of the Antiquity of Man” (“Transactions,” vol. xiii. page 316). The following is the text of his Grace’s letter (Ed.) :—

“I concur entirely in the general argument of Professor Hughes on the antiquity of man.

I would observe, however, that it assumes, as most geologists do generally

I have endeavoured to comply with this request, and propose to take the questions thus:—

1. What are the facts referred to?
2. What are the inferences to be drawn from them as to the extent and relative age of the earth-movements, and their bearing upon the origin and age of the river-deposits from which the remains of man have been procured.

We have, first, the evidence of elevation in the raised beaches recorded at various localities all round our own coasts; and, secondly, the evidence of depression in the submerged forests.

Connected with the raised beaches we have to inquire into the direction of the drift of the stones of which the shingle is composed, as illustrating the set of the currents, the position of the straits, and open shores. We have to compare the shells and other organisms preserved in the old shore-deposits with those that exist on the nearest coast at the present day, and with those that characterize the same or adjoining areas when glacial conditions prevailed in that same area.

We have to consider the characteristics of a true, raised beach, and also whether all forest-beds over which the sea flows may be taken as evidence of submergence, or, if not, how we may distinguish the different kinds.

What it seems to me I am asked to do, is, therefore, to inquire into the earth-movements which have taken place in

assume, that the gravels which have been found to hold human implements are exclusively river-gravels.

I entertain great doubt on this point. The distribution of our superficial gravels seems to me to indicate that some of them do not belong to any river system, but that they have been spread over hill and valley by marine action. If human implements have been found in gravels of marine origin, an entirely new element is introduced into the question.

My own belief is, that a submergence under the sea to the extent of upwards of 2,000 feet has been one of the very latest of geological changes. During part of this submergence, glacial condition prevailed over a large part of what is now Europe.

My further impression is, that man appeared on the scene when the land was emerging, and that the elevation was comparatively rapid. During this period it is most probable that heavy rains prevailed, and if so, the double action of elevation and of continual floods would greatly shorten the time required for the cutting out of the beds of streams or the deepening of valleys.

The Palæolithic weapons indicate a people somewhat in the condition of the Eskimos, and they may have been the outliers of races in a very different condition, who lived in non-Glacial climates to the south.

I wish the attention of geologists were more directed to the question connected with the admitted fact of sea-gravels at a high elevation on our Welsh and Scottish mountains."

Glacial and post-Glacial times, with special reference to the deposits in which the remains of man have been found.

Most men, who have been looking into these questions, have their own view of the sequence of events which have affected the physical geography of the country from Glacial times to the present day; but they should try not to let a theory colour their view of everything they examine. I will give you an opportunity of detecting and eliminating the personal error from my communication this evening by giving you, at the outset, a short sketch of what are the conclusions I have arrived at with regard to the later changes in or immediately affecting our country.

Out of the great mass of material collected, I have to select only a small number of cases; first of all choosing those which bear most clearly on the questions which interest this Society, and, secondly, out of them, selecting those in which the evidence is most clear. In such cases as that before us we must not expect to explain all the phenomena which Nature has left half-exposed to our gaze. We may be well content if we get clear evidence from a few, and in the others do not see anything contradictory to the obvious conclusions arrived at from them.

First, then, I will premise that I think it far more likely that secularly recurring cosmical combinations may determine the time and manner of earth-movements, than that, by any direct effect upon the amount of heat and light received from the sun, they have produced those great vicissitudes of climate of which we find evidence.

To be more particular, we find that, as now, in every latitude, glacial conditions always accompany great elevations, and that this confirms the conclusion we should arrive at from the distribution of the drift, &c.—that during the Glacial Period the mountains of Wales and Scotland were very much higher, and that when, at the close of the Glacial Period, there are proofs of submergence, there we have evidence also of an amelioration of climate.

But we do not gather from the calculations of physicists that the difference of temperature due to astronomical combinations could, under any circumstances, be so great as that which we see along the same parallel of latitude at the present time, and which must obviously be due to geographical causes. While geology does not point to any regular decrease of temperature, such as might be suggested by the knowledge of the secular cooling down of the globe, but rather shows recurring higher and lower temperature in the same area, we must bear in mind that the parts that were raised the

highest have to be depressed the lowest to resume their original relative position, and that there is plenty of evidence of successive movements of elevation along the same axes,—along the Pyrenees, for instance, and along the area we have now to do with, viz., Wales and North-Western England; so we need not at all assume a uniform elevation or depression over the whole of Britain at the same time.

We start then with this. There was a time when the mountains which run down through Scandinavia, Scotland, the north of England, and through Wales, were so high that icefields and glaciers prevailed along the whole range. Now we must refer to a few figures. If an elevation of a little over 2,000 feet extended over an area so wide as to take in some of the borders of the Atlantic to 300 or 400 miles beyond the coast of Ireland, where the sea bottom runs down from 2,130 to 10,700 feet in about 15 sea-miles, and it were all uplifted, we should have land all over from the Continent 400 miles out into the Atlantic beyond the coast of Ireland. The mountain ranges would be so much further from the sea, and the climate be less *insular* and less equable. The deep valley running down where now we have the Baltic Sea would bring glacier ice from Scandinavian fields; and from the Norway coast, probably, other ice would creep south. But we need not assume a uniform elevation. Probably, the amount of elevation was highest in the mountains, and at first, when Scandinavian ice predominated, it overrode the Scotch mountains. Scotch glacialists tell us they have evidence of this. Precipitation being equal, the more northern colder regions generated more ice, even if the mountains were not higher. So, from the mountains of Scotland, ice pressed the Lake District, from which, again, the ice held back the glaciers from the North Welsh heights, and turned them to the East.

But when submergence followed, the Scandinavian ice stopped short of Scotland; and so in turn each more southern group of hills was freed to distribute its own ice all round as the ground fell easiest for it.

This is the commencement of the period with which for our inquiry we have most to do. What kind of country was here before the Glacial Period we have not much to tell. A few marine deposits on our eastern coast tell what the creatures were that swam the seas some time before, but of the plants and animals upon our hills and plains we know but little.

After the period of extreme glacial conditions the land went down, and warm currents from the south and west approached the hills. We cannot suppose that all the forms of northern life were driven back at once, but by degrees they all retreated

to the north, and southern forms advanced. So, when we try to correlate glacial beds in England with those elsewhere, we must not too hastily assume that the regions characterized by certain forms were defined by the same boundaries as now hold good.

The downward movement carried down the land to far below the level at which it stands at present, and since that it has been coming up again with oscillations. Now, we must inquire in greater detail into the evidence.

What was the greatest height to which it rose in Glacial times we have not evidence to prove. But we can show a depth to which at least it must have sunk after the Glacial times.

On the western spurs of Snowdon, in a trough between Moel Tryfaen and the hills, there is a bed of sand and loam in which are whole and broken shells, most of them species found upon the coast to-day. With them are stones such as are found in the drift about, not much water-worn; some even retaining the glacial scratches; and, perhaps, most interesting of all, there are not uncommonly flints such as occur in gravel-beds in east and southern England,—sub-angular, ferruginous, some more, and some less rolled.

We will make these beds a central point around which we will collect our evidence. They have been noticed by Trimmer,* Durbishire,† Lyell,‡ Ramsay,§ and many others. They are well-known, and all the leading facts are well-established. First, as to its height above the sea. The bed in which the shells are found, according to Ramsay, runs up to 1,170 feet,|| but Ramsay holds that beds precisely similar, and to be bracketed with them, but which have not yet yielded shells, run up to heights of 1,800 feet or more on the same mountain group.

At Macclesfield,¶ near Manchester, another bed like it, and containing mostly the same shells, was found by Prestwich at 1,250 feet above sea level, and near Congleton** Ramsay records another at 600 feet. From the time when the mountains of that district were so high that glacier ice crept down them, to the time when all the land went down from 1,200 to 1,400 feet below its present level, must surely have been an

* *Proc. Geol. Soc.*, vol. i., p. 331.

† *Proc. Manchester Lit. Phil. Soc.*, 1863-4, p. 177.

‡ *Ant. Man.*, p. 315.

§ *Phys. Geol., &c.*, p. 413.

|| Durbishire estimated the highest point from which he obtained shells at 1,370 feet.

¶ Durbishire, *Geol. Mag.*, vol. ii., p. 192.

** Ramsay, *Phys. Geol., &c.*, p. 413.

interval sufficiently long, and the geographical and climatal changes involved must have been sufficiently great to have allowed the arctic forms to migrate north, and southern life to take their place; but what the shore in earlier Glacial times contained we cannot tell. It has not risen again, and lies still deep below the sea.

In these Moel Tryfaen beds some fifty-four species have been found; of these, thirty-seven are still living in the neighbouring sea.* Now, we do not get gravel and sand continuous from this height down to the level of the shore. But on the northern shores of Cardigan Bay, in promontory of Lleyn and Anglesea, Ramsay records them. Near Macclesfield nearly the same group of shells occurs.† A happy combination of conditions preserved these two records of the great submergence. Between these two points there is no evidence of any similar beds so high; but at a lower level, gravel, sand, and loam occur at various places along the North Wales coast, and with numerous shells up to between 200 and 300 feet. These seem, from the cumulative evidence to be given hereafter, to belong to a later period of the same great submergence, and as the land had not risen high enough to reintroduce glaciers upon the heights, so there was no recurrence of colder forms along the shore; but the migration of southern forms towards the north had still gone on, and so we find but two or three arctic types among the shells.

For instance, in the Vale of Clwyd, at various points we find a mass of sand and gravel associated with red clays with boulders, some round, some broken, some showing glacial striae, and some not. The shells occur both in the sand and in the clay—more commonly in the sand. The sand and gravel are oftener in the middle, with clay above and below; but sometimes there is hardly any clay, sometimes no sand.

The shells are almost always fragmentary, and all but two are common on the coast but six miles to the north.

They are :—‡

Dentalium abyssorum or *tarentinum*.

Littorina littorea.

* More recently, Mr. Gwyn Jeffreys has given a list of the Moel Tryfaen fossils, corrected up to the latest date (*Quart. Journ. Geol. Soc.*, June 9, 1880). He says that there are sixty species, besides three distinct varieties, of which eleven are arctic, or northern, and the rest still live in Carnarvon Bay.

† *Darbishire, Geol. Mag.*, vol. ii., 1865, p. 293.

‡ Most of them were determined for me by Searles Wood, Jun.

- Trophon clathratum (=T. truncatus=Fusus
Bamffius).
 Pleurotoma (Mangelia) rufa.
 P. turricula.
 Turritella terebra.
 Artemis exoleta.
 Astarte borealis.
 Cardium edule.
 C. echinatum.
 Mytilus edulis.
 Ostrea edulis, young.
 Tellina balthica.

If we follow these beds round the eastern flanks of the Welsh hills to the south, we can trace them now in continuous sheets of sand and gravel, now in detached terraces and patches down to the basin of the Severn. They are probably the beds mentioned by Murchison* and by Trimmer.†

If we examine them, following the excellent work of Mr. Shone,‡ of the Chester Society of Natural Science, as they stretch at lower levels across the estuary of the Dee, and here and there along the western coast of Lancashire, towards the Lake District, we find just the same evidence,—re-sorted drift, with shells, some showing affinity with northern types, but most of them like recent temperate forms. Before we leave the north and western shore of this primæval sea, let us consider what the obvious simple explanation of the whole may be.

When the lofty ice-clad land began to be submerged, the sea lifted and floated off the ice that came down to its level in glaciers, so all the lower lands beyond the mountains were still loaded with iceberg débris, which could not have come if one ice-sheet prevailed over all the mountains.

This débris, too, was different, according as the ice from Scandinavia, Scotland, or North Wales prevailed. As still the land went down, the climate changed, and the ice receded, no longer reaching the sea level, and so no longer bergs floated from the ice-foot with their load to distant spots. But on the flanks of hills the accumulated débris of the earlier times was eaten into by the waves, as on that sinking land successive parts were brought within their action. Then, as now, the shingle travelled round the coast from bay to bay, and any

* *Sil. Syst.*

† *Proc. Geol. Soc.*, vol. ii., p. 200.

‡ *Quart. Journ. Geol. Soc.*, vol. xxxiv., p. 383.

mass of older gravel which fell in left traces all along. So the flints from ancient gravel-beds, much further east, got scattered all round this ancient coast-line.

Now to return to the deposits on the flanks of the North Wales mountains, we shall see that the above explains their character.

First, the shells found on Mount Tryfaen are of earlier date, and therefore of more arctic type than those that lived along the shore when the emergence, after the great depression which lifted off the glacier ice, had gone on much longer and raised the land 1,000 feet more.

Then as to the flints which I have found all round the coast—in the plateau gravel of St. David's, in the shell-bearing beds of Moel Tryfaen, in the clays and sands of Anglesea, Colwyn, in the Vale of Clwyd, and in the gravels of the Cheshire plains. A submergence of 1,000 feet would leave Wales a small group of islands, and the gravel travelled from the east when, with a depression of a few hundred feet, the sea rolled through the straits between the Lancashire and Cheshire hills, swept along the Malvern ridge, and from the Severn to the Dee. I think it more probable that the flints came with the eastern gravel at this period than that they were carried from the North of Ireland, because they occur only in this later drift.

Here we are coming to another point of great importance in our inquiry. What evidence can we find that any beds upon the lower slopes showed evidence of ancient drift *remanié* by the sea. In the Vale of Clwyd there are beds of clay, gravel, sand with shells, which we have seen are all but two the same which now are found upon the shore some five miles off. In the clay are glaciated stones and rocks which must have come from other areas across the watershed to the west. Now, it is clear that when there was land-ice to carry them so far, conditions must have been unsuitable for such a temperate group in that same place. Again, we find sticking in the clay fragments of rock that have been striated by glacial action, then broken up, and the fragments scattered. The specimens show that the later fractured sides have never suffered glacial action. There are also in the sand and shingle balls of clay with pebbles stuck all over the outside, just such as now occur where cliffs of glacial drift are washed by the sea at Colwyn and elsewhere, and pieces of the clay fall on the shore, are rolled, and have stuck on them the pebbles of the gravel on which they roll. Similar clay-balls may be seen along the coast of Sheppey, covered in like manner with small stones and shells.

So we may have in such an area marine beds partaking of the characters of the oldest drifts, but, when looked into carefully, obviously of later date, and only made up of the debris of the older drift.

It is quite possible that the beds described by Mr. Shone, from lower ground near Chester, may be older than those in the Vale of Clwyd, and distributed along the straits before the land rose high enough to form the estuary of the Clwyd, or it may be that northern currents kept a more arctic fauna here and there, or perhaps they were in part derived from older Glacial beds. The reason of the more arctic character of the Chester beds is not quite clear.

Now, if we follow these beds to the east we shall find similar sands and gravels, but perhaps more largely derived in some places from the Trias sandstone, half-across England. On the north the bounding shore is not so clear as round the hills of Wales. The beds of Macclesfield, we have seen, correspond with those of Moel Tryfaen, and the shells are much the same.

Still more to the east and a little further north we find the marine sands of Kelsea Hill containing a not very arctic type of shells, while in the old boulder clay of Dimlington Hill on the coast north of Holderness, in company with Mr. Leonard Lyell, I found a small lenticular mass of sand full of shells such as occur in what used to be called the Bridlington Crag. There were among them *Nucula Cobboldiæ* and *Astarte compressa*, with the two valves united, and other decidedly arctic forms. These shells are now in Mr Lyell's collection who gives the following list :—

- Saxicava rugosa.*
- Astarte borealis.*
- A. compressa* (young, both valves united).
- Nucula Cobboldiæ.*
- Turritella* (from clay).
- Cyprina Islandica.*
- Tellina balthica.*
- Mya.*
- Fusus striatus* (from clay).

Here I take it we have, far away from the high mountains, evidence in the one deposit of the time when the sea was chilled and arctic life prevailed, in the other deposit record of the time when changes of level had let in warmer currents, and the temperate forms of life.

These movements extended north through Scotland, where traces of shell-bearing sands are recorded up to 500 feet, and

evidence of much more recent elevation has been seen by some, but this is not quite clear.

To cross to Sweden. The beds of Uddevalla* show an upheaval to 200 feet since most of the shells now living on the coast of Norway had arrived.

And in the recent voyage of Nordenskiold he records in many places, in still more northern latitudes, clear marks of elevation in geologically recent times up to at least 500 feet.†

This is the period that is of most importance in our present inquiry; and we learn, putting the evidence all together, that after Glacial times the land went down along the Cambro-Scandinavian range of mountains, and the encroaching sea used up old Glacial beds; that it took a long time before the arctic forms of life that haunted the shores of the old Glacial land were driven north, and temperate life came in. The mountain range went down far lower than it stands at present, and then a reversed movement commenced, and all the land has been coming up, with interruptions, ever since, and from an unknown depth has been again raised up in places to at least some 1,800 feet. It is probable that since Glacial times the land was much more extensive than it is now, and that this was due to elevation, not of the mountain ranges, but of the sea-board lands. We see this, not so much in the fact of the sunk forests, as in the size and character of the trees in them; for they are of far more luxuriant growth than we now find so near the sea.

Now we are closing round the country of which we most desire to learn the history, namely, that drained by the large rivers along whose banks we have evidence of man's sojourn in palæolithic times. There are a few cases where, it is said, implements of that date have been found along the borders of the Lake District, and where the forms of mammals usually associated in those early times with man have been preserved. But, as a rule, they are absent from the gravels there; and to explain this fact some hold‡ that they were all pre-Glacial, or earlier than the latest glaciers, and that they have all been swept away by ice. I cannot accept this view in its present form. Man may have followed hard upon the receding glaciers, when in the latest period of their existence the climate was so far ameliorated, owing to depression of the mountain ranges,

* Lyell, *Phil. Trans.*, cxxv., and *Ant. Man.*, p. 63.

† The Arctic voyages of Adolf Eric Nordenskiold. Lond. 1879. P. 324.

‡ Tiddeman, *Brit. Assoc. Report.*

that ice no longer came so low, nor covered the whole coast. This would explain the solitary appearances of his remains recorded here and there; but I fail to see the force of the reasoning upon which it is assumed that man and his associates once were there, and their remains have been all swept away by ice.

Travelling now south the estuary of the Wash gives little information on this question. The whole surrounding country is so low that 20 ft. depression would leave but a few gravel-mounds here and there above the water, and the sea is kept back by silting up of channels and artificial banks. However, at March, a town in the Cambridge Fens, some twenty miles from the Wash, a gravel-bed* occurs full of sea-shells of recent temperate facies. At Manea, immediately beyond, at the same level in sand and loam, the *Corbicula fluminalis* is abundant. This little shell, now found no nearer than the Nile, is characteristic of the older river-gravels, which were deposited we know after Glacial times, because the older gravels have more, the newer less, of their material derived from glacial drift.† I see no reason why in the March gravels there should not be remains of man washed out to sea from those that lived along the river banks or were lost along the coast. The wonder is we have not found marine deposits of this age with the remains of man. The beds, so far as I know them in Norfolk and in Suffolk, from which palæolithic implements have been procured rest on Middle Glacial, a much older series; but if marine beds derived from these and representing the deposits of the estuary or mouth of the large rivers along which man lived were exposed we might expect to find some traces of him, and it would be difficult to distinguish the newer from the older beds. But we have not in all this area evidence of extensive earth-movements in the existence of marine deposits far above the present sea level.

The only marine quaternary beds in the Hertfordshire ‡ district are, I believe, of much earlier date, and do not bear upon the question now before us.

Coming now to the Thames basin, we have again but scanty evidence of upheaval. There is, however, some. In the extensive excavations for brickmaking near Sittingbourne, it was clear that there were at least two divisions of

* Seeley, *Quart. Journ. Geol. Soc.*, vol. 1866, p. 473.

† Seeley, *Quart. Journ. Geol. Soc.*, vol. xxii, p. 479. Fisher, *Camb. Phil. Soc.*, 1879.

‡ *Quart. Journ. Geol. Soc.*, vol. xxiv., p. 283.

the gravel underlying the brick-earth, in the lower of which remains of oysters occurred. Even this was not a very clear case, but as far as it went it pointed to a slight rise along the lower reaches of the Thames, and to a more rapid denudation of the valley in consequence.

The investigations of Mr. Spurrell in the Crayford brick-pits show that since man lived on the shore of the Thames estuary, beds of sand and gravel, containing remains of the mammoth and tichorhine rhinoceros, of the *Corbicula fluminalis* and *Unio littoralis*, have accumulated to a depth of at least 37 feet over the remains of man. If we may assume that these were estuarine deposits, they must have been upheaved some of them more than 50 feet above the level of the river. Having recently examined the ground carefully with Mr. Spurrell, and dug out numbers of the worked flints with my own hands, I am convinced that the evidence is quite satisfactory.

In the Somme valley, the other valley of greatest importance in our inquiry, there is a shell-bearing bed at Menchecourt,* but this is also at quite a low level, and merely points to estuarine conditions running further up the valley, but to no extensive elevations in palæolithic times ; and along the valley there appears to be no trace of any higher beds, with marine or estuarine remains, as yet discovered, although the flanks of the valleys have been so extensively cut into for brick-earth and gravel.

We will now see what we can obtain from an examination of the coast lines of the Channel.

Here, of course, we have to deal with raised beaches and submerged forests, and, to begin, I will offer a few words of caution, as it is not every deposit containing shells lying above the highest tide that can fairly be considered a raised beach ; nor is it every old forest over which the sea flows at every tide that can be truly called a submerged forest.

It is well known that, in a bay, especially where the sea rolls in over a long-shelving shore, the waves run up far on to the beach, carrying shells and stones above the line to which the water could raise them against a wall or cliff. So when, from the destruction of a headland, or other local change, the sea cuts down such a shelving shore, and leaves a cliff, the base of which it scours, it would appear, at first glance, that we had there, in the highest portion of the old sand margin, a raised beach, and it would be received as evidence of an elevation of the coast.

* Prestwich, *Trans. Soc. Ant., Lond.*

A few solitary shells in sand and stones are not enough. It is wonderful how the wind can carry, especially with the broken water of a storm-driven wave, shells and stones far on to the land. We must be careful not to be taken in by blown sand, even when there are here and there small layers of shells in it. I have myself seen a Nassa travelling up the slope of a sand-dune under the action of the wind alone. When such shells drop over into the trough beyond, and get buried up, they might well be taken by some to indicate that the whole shore has been so far raised.

We should examine carefully whether the deposit is undoubtedly marine, the shells, stones, sand, &c., showing clear evidence of having been sorted by water; and, secondly, whether it is quite clear that, under no conditions of long shelving shore, they can have been carried thither with the relative height of sea and land in other respects unchanged.

Yet there are raised beaches, and, as they are conspicuous features in a coast section, there are plenty of descriptions of them. Sedgwick and Murchison described a raised beach in Barnstaple or Bideford Bay (*Trans. Geol. Soc.*, series 2, vol. v., p. 279). De la Beche, in the *Geological Observer*, describes and gives sketches of some raised beaches (p. 452 *et seq.*), and gives some useful cautions at p. 261. In the Report on the Geology of Devon and Cornwall he mentions more. Godwin Austen, Pengelly, Carne, have, too, described various others, and a useful summary is given by Mr. Ussher in the *Geol. Mag.*, 1879.

So for the submerged forests, there are sources of error often overlooked. If a low estuary or seaboard marsh gets silted up, as, for instance, the Wash, the mouth of the Somme, or the marsh behind the shingle bank at Westward Ho, and then along the seaward side sand-dunes are blown, as at the mouth of the Somme, or shingle drifts along the coast, and forms a bank, as at Westward Ho, then the high tides are checked, and peat accumulates, and trees grow in the shelter behind the bank. But in a changing, sea-washed coast, these banks of sand and shingle are sometimes swept away, and the sea rushes with every tide across the forest land; soon the trees perish at their roots, break off, and perhaps are floated away or buried up in mud and sand. The water, too, running with every ebb into and through the porous soil, carries off some of the underlying silt, and so, sometimes, the whole is lowered gently towards the sea.

Again, we must be careful that we have not got only the waterlogged wood and drifted vegetation sunk in the estuary

or in the sea—such as is found in masses at the mouth of the Mississippi and other large rivers. Indeed, it seems hardly safe to infer submergence on the simple evidence of the bed itself, unless you find the stools of the trees *in situ*, with their roots penetrating the underlying soil, and also find the bed passing beneath low-water mark.

De la Beche, Henwood, and others have described the submerged forests along the southern coasts. In the *Quart. Journ. Geol. Soc.** is a paper by Mr. Smith, of Jordan-hill, "On recent depressions in the land," in which he gives many legends and traditions probably founded on the obvious marks of changes of level along the coasts of the channel. He also records, on the authority of Capt. White, R.N., who, under the direction of the Admiralty, surveyed parts of the coast, that there were stumps of trees *in situ* not less than 60 feet below high-water in the Bay of Cancale, where the tide rises and falls about 50 feet.

There are many sources of error when we regard the evidence of submergence or of elevation, but when we have got rid of these there still remain plenty of well-authenticated cases of raised beaches and submerged forests to show that movements always have been going on, now up, now down, and therefore we must allow for the acceleration or retardation in the rate of waste in all the valleys within the area so affected. As we trace these movements north to the borders of the mountains, we find evidence of greater sinking and greater elevation, perhaps because we have there the mountains as our gauge on which are marked the various depths by nature in terraces and banks of shells, but more as I believe because along the mountain chains the movements were always greater. This point is clear, that after Glacial times the land went down in places, probably at least 2,000 feet below the sea, and then the ice was lifted and melted off. After that the land began to rise, and by this time the sea was warmer and the forms of life less arctic, as seen at Moel Tryfaen, Macclesfield, and later on the Vale of Clwyd and Kelsea Hill. And now destruction of all softer beds went on, whether by the sea eating along the coast, or streams tearing the mountain-sides and flanks of hills, or larger rivers undermining as they flowed along banks of old glacial drift. In all the earlier deposits resulting from these agencies we see the great preponderance of glacial drift used up by denudation, as compared with the proportion found in the later beds, when the covering of drift

* Vol. iii. (1847), p. 234.

had been in a great measure removed. Then man advanced as the land rose, now bared of ice, and lived along the rivers that drained that land, and with him the large mammals associated with him in paleolithic times. Earth-movements still went on, and probably still are going on, checking the rate of waste in one valley and hurrying it in another, adding another element of uncertainty in all our calculations of the date of man's appearance.

The CHAIRMAN (J. E. Howard, Esq., F.R.S.).—I may tender the thanks of all to Professor Hughes for his very able and interesting paper. Although no geologist, it has been necessary for me to acquaint myself, in a measure, with some geological facts, having been for nineteen years chairman of a slate-quarry in North Wales. I am, therefore, able to confirm what Professor Hughes has stated with regard to the features of the country, and I believe, as he has been telling us, that there has been an amazing variation in the level of that part of the country, with a depression perhaps of 1,500 feet, and subsequent elevation, whilst the amount of disturbance was much less on this side of the island. The question of alteration of temperature is one that it is clear we have not yet got to the bottom of. I think I am justified in saying we have proofs of a climate in Greenland which allowed a growth of vegetation similar to that of the Southern States of North America, such as magnolias, &c., that would involve perhaps an average of twenty degrees higher temperature than exists now in Greenland. I do not believe that any alteration which we can conceive in the elevation of the mountains in this part of the world, would cause such a difference of temperature. Moreover, I have had in my hands a section for the microscope, of a small tree from the extreme north, which seems to imply a totally different climate to that which now prevails. The circumstance of any possible change of the earth's axis, will not allow, as Professor Hughes has said, of any such alteration of climate as we are considering for Greenland. The question is, under what conditions have these changes arisen? Of course we have yet very much to learn. I now ask those more acquainted with the subject than I am, to give us the benefit of their knowledge. So far as mine extends, it is confirmatory of what Professor Hughes has been telling us, with this exception, that I do not think the facts bear out the inferences as regards the alteration in the climate.

Captain F. PETRE.—Before the discussion commences I have to read the following letter from Professor W. Boyd Dawkins, F.R.S. :—

“ The Owens College, Manchester, March 12th, 1880.

DEAR SIR,—I regret that I am unable to come to your meeting next week to support my friend Professor Hughes, on whose essay I have no criticism to offer, as I agree with the whole of it.—I am, dear Sir, yours truly,

W. BOYD DAWKINS.”

Rev. W. B. GALLOWAY.—I have long been interested in the progress of geology, and have watched its many changes, and the theories which have been raised and rejected. Facts have been collected under erroneous theories, but even an erroneous theory has the advantage of exciting the interest of those who favour it, and in educating extra facts, all of which go eventually to the discovery of the truth. Those facts which Professor Hughes has so interestingly and clearly placed before us this evening, we must all accept. There is no difference of opinion as to the facts, but in regard to the cause which has influenced the deposits of these various substances, there may be very different conjectures. The Glacial theory was not the theory when I first became acquainted with geology, but the Diluvial theory, which was maintained by Buckland. It appears to me that the Glacial theory has been put instead of that Diluvial theory, and that it has been put in place of it with very great disadvantage. Taking the fact of an universal deluge, many of those things which have been so clearly described may be accounted for by diluvial deposits. There arose the question how so great a quantity of water as to submerge all the earth existed ; but that has been answered by Lyell and others, who found that the average depth of the sea is about fifteen times the height of the land. Nothing, therefore, of a difficulty exists as to the quantity of water ; but as to the manner of submersion some difficulty might arise. It is admitted that there is a sunken continent in the Southern Ocean, and the fact of its sinking may have influenced the change of the earth's axis ; and may not the description given by the late Polar expedition of the Palæocrytic ocean suggest some thoughts to us of the effects of a sudden change of axis ? Now, if a change of axis took place on this earth—and I think strong evidence can be brought forward of such a change from the shifting of the magnetic pole—an idea was once started that there is a nucleus of the earth revolving differently from the earth itself, over which the changing body of the earth may slip,—and if that change of axis were sudden, inevitably the waters of the sea must have been thrown over the land in a very violent manner. Near the North Pole the fields of ice must have been thrown in a southerly direction—towards the south-east and south-west—drifting over the continents, and carrying portions of rock—huge boulders—which might be deposited here and there. That those boulders have been deposited chiefly in the northern regions, that they do not extend to the tropical climates, favours the idea that they were carried by icebergs from the north. There is this evidence of the change of axis in the geological facts taught by Lyell, that the deposits of coral in the neighbourhood of Vienna, and in parts of the north of Italy, give evidence of a similar temperature having existed there and in Jamaica, the same kind of substances being found in both. There is now a great difference of latitude between these places—about thirty-one degrees ; and there is evidence that at one time there was no such difference. There is also this fact, an astronomical fact. If we take into account the idea of the best astronomers—I believe of all of them—that the secondary planets were

originally part of the diffused substance of the planet itself, and revolved with it, it is probable that the plane of the revolution of the moon would correspond nearly with the plane of the earth's equator. But the plane of the moon's orbit is at an angle of about five degrees and nine minutes to the plane of the earth's orbit round the sun, while the plane of the earth's equator is at an angle of about twenty-three degrees and a half. It was formerly more—it will by-and-by be less. This shows a change of the inclination of the earth's equator, and consequently of what originally was the axis of the earth, to the extent of the difference between these two. That difference will be eighteen and a half degrees, and that difference is also about the distance between the magnetic pole and the geographical pole. Thus, if the magnetic pole at one time coincided with the geographical pole, their present amount of divergence points towards the same conclusion, that there has been a change of axis to that extent, and so corroborates the fact of a universal deluge, which would necessarily follow such a change, if sudden or very rapid. Then, in regard to the flint formation, I think I can produce specimens which seem to suggest a meteoric origin. I have specimens which contain vegetable roots, &c., which suggest that the flints are as much of terrestrial origin as a sea formation.

Mr. D. HOWARD.—There is one question I should like to ask, and that is with regard to the changes of level in the Atlantic, whether they have been specially studied, and whether they are comparatively local, or if the whole country moved together, because it would very much depend upon this as to how far we should expect to find that the whole of England sank together and rose together? It might be possible that Wales might be submerged, and France not. Otherwise it seems difficult to understand how we entirely miss the marine gravels on the French coast.

Mr. T. K. CALLARD, F.G.S.—We are greatly indebted to Professor Hughes for the admirable paper we have before us to-night, and for the large amount of information given to us by one who has a right to speak with authority upon these questions. We are also indebted to his Grace the Duke of Argyll for asking the questions which have given rise to this paper. One of the questions has been answered very satisfactorily. I think we have had clear proof of the depression and elevation of the land. We have also had proof that these depressions and elevations have taken place in recent geological times. But there is one other question put by his Grace which, if we had had time, I should have liked to have heard answered, viz., the origin of the gravels containing the implements of man. It is evident that the Duke of Argyll is not quite satisfied that these gravels are river deposits. Professor Hughes speaks of “the inferences to be drawn from the extent and relative age of the earth-movements, and their bearing upon the origin and age of the river-deposits from which the remains of man have been procured.” It is possible that these valleys,—the valley of the Thames and the valley of the Somme,—may have been formed before the land went down. If so, when the land was re-elevated, instead of a great length of time being required for the erosion of the valleys, they would

have been cleared of the detritus that filled them in a comparatively limited period. Had such been the case, it would have destroyed the argument for the antiquity of man. I should be glad to hear from Professor Hughes whether, in his opinion, the land went down to a depth sufficient to allow of the water covering those spots where the implement-bearing gravels are now found. If it did not, then the falling and rising of the land, to my mind, gives no clue to the age of the river deposits. But are these gravels really river deposits? This is the point which the Duke of Argyll is inclined to dispute. There are two or three reasons why I doubt these gravels being river deposits, and one is the height at which they are found. They are not merely in patches on the slopes of the valley, but are spread on the highest ground of the Somme Valley,—a condition of things which, it appears to me, difficult to understand; for I cannot see how the river Somme could have deposited these gravels at such heights. Another question arises, how came the flints shattered? the slow movement of the water from the very small fall it had at that time, not amounting to so much as 2 feet in a mile, could not have done it. I should not have expected to find flints in this condition [producing them], simply from gradual river erosion.

MR. S. R. PARTISON, F.G.S.—I think the paper read by Professor Hughes has been most exhaustive of the whole subject. With the motives of true science he has abstained from drawing deductions which the facts did not allow of finding; and I suppose that although we should all have been very glad indeed to have had the correlation of the river-gravels with any of those gravels which have been mentioned to-night, yet he has resolved that question by reference to what he supposes to have happened during the retreat of the glaciers. Beyond this I think he has not led us, nor did his paper profess to do so. I suppose that enjoyment is to be deferred to some future time. We have been many years pulling down old theories and turning opinion to the Glacial period, and probably at some more modern time we may be pulling down the Glacial theory. But I should be very sorry to attempt to lay any crude speculations before the Society, especially in the face of a paper so full of facts as that which we have heard to-night.

PROFESSOR HUGHES.—I think I must pass by some of the questions that have been raised, as they wander a little beyond the subject which we have been discussing. With regard to the age of the Thames deposits as compared with those of Moel Tryfaen, the point which I wish clearly to bring out is this: that after the close of the cold period the ice was lifted off by submergence of the land, and our story begins when the land came up again. In the earlier deposits, of course, the shells and the various other organisms, show that the arctic forms had not all gone away. In the later deposits we have more and more southern forms. It was in this post-Glacial period that the Thames Valley received the deposits which we find in it. The included remains show that these deposits are fluviatile or estuarine. With regard to the many remarks and ingenious theories which have been brought forward by the second speaker, it is perfectly true that a deluge is not impossible; but the question as to whether on examining the surface of the earth you have

reason to believe that it was universal or local, is another thing ; and in the periods with which we are now dealing there is not a sweeping away of all the animal life which lived there at any one time. It is better to receive a simple explanation than to try and explain obscure phenomena by reference to violent shifting of the axis of the earth. The persistence in the forms of life would offer a difficulty in accepting such a theory. The alterations in the magnetic pole is another thing. Those changes are too rapid to depend upon the great changes of the axis of the earth. With regard to the question of the solid nucleus that has been referred to, the friction between the solid nucleus and the crust would be too great to allow us to entertain any such opinion as that at all. It was brought forward some years ago, and it was shown by mathematicians at the time that it was an impossibility, and it would not help us in the present case, because it cannot be shown that the changes coincide with those climatal variations we have to explain. The simple explanation of wood being found in flint is, that there were plants on adjoining land, and fragments were washed into the cretaceous sea, and the part of the chalk in which they were embedded was replaced by flint. With regard to the palaeocrystic ocean, the manner in which the ridges are formed is this : when you have a large ice sheet formed on the water, and that sheet contracts by the reduction of temperature, you have to allow a mètre in every thousand for contraction, which amounts to a considerable quantity when you are dealing with the great fields of ice in the Northern seas. After this chasm has been formed the water between the walls of ice freezes, and then comes another change of temperature ; expansion thrusts the ice walls together, and squeezes the newly-formed ice out. This, happening year after year, causes those great hummocky ridges which have been spoken of.* There is no doubt about elevation often being local, because many elevations which we have been able to observe are local. In New Zealand there was a clean cut, which could be traced right across the country. In South America it has also occurred. With regard to the question raised by the Duke of Argyll as to whether those gravels are exclusively of river origin, I can only say that the gravels I referred to are known by their contents to be of river origin, If his Grace had mentioned any particular group of implement-bearing gravels which he thought were not of river origin, then I might have discussed the question. I fully allow the probability of the existence of contemporaneous marine beds containing human remains, but in this paper have dwelt chiefly on the bearing of the admitted fact of sea-gravels at high elevations on the question of the antiquity of man. With regard to the shattered flints, almost all flints of this kind (referring to specimen exhibited) are shattered by surface action,—the action of changes of temperature due to frost and sun.

The meeting then adjourned.

* Nordenstjöld, op. cit.

ORDINARY MEETING, APRIL 5, 1880.

H. CADMAN JONES, Esq., M.A., IN THE CHAIR.

The minutes of the last meeting were read and confirmed, and the following elections were announced :—

MEMBER :—The Rev. Canon W. Ince, D.D., Regius Professor of Divinity, Oxford.

ASSOCIATE :—Rev. G. Weaver, South Africa.

The following paper was then read by the Rev. T. M. Gorman, M.A., the author being unavoidably absent :—

LIFE AND ITS PHYSICAL BASIS. By H. ALLEYNE NICHOLSON, M.D., D.Sc., F.R.S.E., Professor of Natural History in the University of St. Andrews.

"Ante omnia itaque scire convenit, quid sit illud quod vulgata appellatione Vita dicitur? In quo consistat formaliter? Circa quid versetur et occupetur tam materialiter seu subjective, quam finaliter et objective?"*

THE whole subject of the nature of life and of the connection between vitality and the matter by which it is manifested, is one of such vastness and complexity that it would be impossible to treat it adequately, save in a special and extended treatise. Upon the present occasion, I need hardly say, I shall attempt nothing further than to give a brief and general sketch of the fundamental phenomena manifested by living beings, and of the more important considerations which, it appears to me, should guide us in arriving at some

* G. E. Stahl, *Theoria Medica Vera*, Ed. by Choulant. 1831. P. 253.

judgment as to the essential nature of that which we call "life." The mere historical retrospect of the various views which have been at different times entertained and published as to the nature of vitality, however brief and bald, would occupy no inconsiderable time, and I shall content myself here with a short discussion of the latest phases into which this question has entered; while I must entirely omit all considerations relating to the subject, still a contested one, of the origin of living matter.

We are, in fact, enabled with advantage to eschew all formal review of the theories and controversies of the older writers upon this subject, by taking as the basis of our argument the now universally admitted fact that what we in general language call "life," is manifested only by the particular form of matter to which the now familiar name of "protoplasm" is applied. Living bodies, however simple, are probably always in part composed of other substances than protoplasm; and when at all complex they unquestionably are so. Still, it is certain that the phenomena to which the term "vital" can reasonably be applied, are invariably associated with the larger or smaller quantity of protoplasm present in the living organism. This, to use the apt phrase of Professor Huxley, is the "physical basis" of life; and though opinions may differ as to the ultimate nature of the connection between this matter and the phenomena of vitality, it is necessary, in the first place, to very shortly consider the chief facts which we may be said to actually know about protoplasm, and to indicate any important points on which our knowledge is still defective.

The first accurate knowledge which we may be said to possess as to protoplasm dates from the earlier part of this century, when Dujardin* pointed out that various of the lowly organised animals now included in the sub-kingdom *Protozoa* are composed of a semi-fluid, apparently structureless, contractile substance, which he designated by the well-known name of "sarcode." The name of "protoplasm" was, ten years afterwards, given by Von Mohl † to a similar substance found in the interior of the cells of plants; and, still later, Max Schultze ‡ accomplished a still further advance by

* *Recherches sur les Organismes inférieurs: Ann. des Sci. Nat.*, Tom. V. 1835.

† *Vermischte Schriften, Botan. Inhalts.*, 1848.

‡ *Organismus der Polythalamien*, 1854; *Müller's Archiv*, 1861; *Das Protoplasma der Rhizopoden*, 1863.

showing that the "sarcode" of the *Protozoa*, and the "protoplasm" of plants were essentially identical in their nature. Since the publication of Schultze's well-known works upon the *Rhizopoda*, protoplasm has been studied by a host of observers, notably by É. Brücke,* Haeckel,† Kühne,‡ Huxley,§ Allman,|| Francis Darwin,¶ and Beale;** and numerous points regarding the place which it fills in the organism have been brought to light.

As before said, it is now universally admitted that protoplasm constitutes that element of the animal and vegetable body, with which the essential phenomena of vitality are more directly connected, and it is therefore important that we should be acquainted with its more important physical and chemical properties. As regards its *physical* characters, protoplasm presents itself as a semi-fluid viscous body, transparent, and either quite homogeneous or minutely granular. In no case known to us has the microscope revealed any actual *structure* in protoplasm, and its *molecular* constitution is, of course, beyond all investigation by means of any instruments at present available. Though during life usually semi-fluid—its precise consistence depending upon the amount of water with which it is combined—protoplasm is coagulated by exposure to a temperature of about 50° C., and it further possesses the singular property of being more or less deeply reddened when submitted to the action of a solution of carmine.

Regarded *chemically*, we may consider protoplasm as being a mixture of albuminoid bodies, or proteine-substances, with water, and probably a variable amount of mineral substances in addition. It is, therefore, a member of that great group of organic compounds which are known generally as the "nitrogenous," or "azotised" substances; and it may be said, roughly, to be a compound of carbon, hydrogen, oxygen, and nitrogen, and consequently to more or less closely approximate to albumen in its chemical composition. It must be admitted, however, that we have no absolutely accurate analysis to fall back upon in dogmatising as to the composition of protoplasm; that we cannot assert from positive knowledge that the protoplasm of animals is precisely identical in chemical composition

* *Elementar-Organismen Wiener Sitzungsberichte*, 1861.

† *Die Radiolarien*, 1862.

‡ *Protoplasma und die Contractilität*, 1864.

§ *The Physical Basis of Life. Lay Sermons*, 1872.

|| *Ann. Nat. History*, 1864.

¶ *Quart. Journ. Microscopical Science*, 1877.

** *Protoplasm*, 1874. Also in numerous other works and memoirs.

with that of plants ; and that we do not even know for certain that the protoplasm of different kinds of animals is absolutely the same. It must also be added that we are still ignorant of the precise vital and physiological relations between protoplasm and chlorophyll, the well-known green colouring-matter of plants, which plays a most important part in the life of the plant, and which, when present at all, is always associated with protoplasm. We must remember, therefore, that though it is convenient to apply the general name of "protoplasm" to the apparently identical living matter of all animal and vegetable organisms, we can only *infer* that this substance is really identical in all the cases where we meet with it, and that the at present ascertained facts do not warrant us in asserting positively that it has a definite and invariable chemical composition.

If protoplasm were an inorganic substance, we should have exhausted its essential characters in describing its physical properties and its chemical composition. We have, however, next to glance at what have been called the "vital" properties of protoplasm ; and here we come at once upon a point which we shall have to consider again, and which has been, I think, too much neglected in all the discussion and controversy which has taken place in connection with this substance. I do not think, namely, that sufficient distinction has been generally made between *dead* protoplasm and *living* protoplasm ; and I am decidedly of opinion that, with our present knowledge, an unwarrantable conclusion has been arrived at by those observers—and they are very numerous and influential—who have always conducted their argument upon the basis that the difference between the two is merely a difference of *state*. The physical properties of protoplasm—as above enumerated—have been determined by an examination of protoplasm in both its dead and its living condition, and these, therefore, may be considered as real and inherent properties of this substance. On the other hand, the chemical composition of protoplasm can only be determined by an examination of *dead* protoplasm, and we are by no means without examples of the almost instantaneous chemical alterations which are apt to supervene in highly complex organic compounds when the organism passes into that condition which we know as "death." We are not, therefore, justified in making the positive assertion that living protoplasm has precisely the same chemical composition as dead protoplasm—as far as the constitution of the latter may be said to be at all accurately known to us. We may infer that the protoplasm of the body—if really a definite chemical compound—remains unchanged after death, until

such period as actual decomposition of the tissues sets in ; but assuredly we do not *know* this as a matter of fact, and any reasoning based upon an assumption that this is the case must be regarded as being, in the meanwhile, open to doubt.

Whatever may be thought as to the validity of the above argument in relation to the chemical properties of protoplasm, no hesitation at all can be entertained as to its force so far as the so-called "vital" properties of this substance are concerned. These properties—as their very name implies—are not, and never can be, known, except as manifested by *living* protoplasm. I do not say that it may not be ultimately proved that they are "properties" of protoplasm, as protoplasm pure and simple, whatever its state may be, and that in the one case they are simply dormant or potential properties, while in the other they are active and visible ones. I do not say that we may not ultimately have sufficient proof to establish the thesis that dead protoplasm and living protoplasm are one and the same substance, with no other difference than that dead protoplasm is in a statical, and living protoplasm in a dynamical condition. I do say, however, that we have not at present a shadow of actual *proof* to support such a thesis, and that it is begging the entire question at issue to speak of the "vital properties" of protoplasm at all. If there be—as for all that science has yet proved there may be—any truth, or kernel of truth, at the bottom of the old vitalistic theories, then, however modified a shape these theories may assume, it will remain true that the so-called "vital properties" of protoplasm are properties which belong to it in virtue of its being *alive*, and not in virtue of its having the physical and chemical properties of the substance known under this name.

I shall return to the point here alluded to again, and we may pass on now to briefly consider what the so-called "vital properties" of protoplasm actually are. In other words, what are the essential phenomena manifested by a living mass of protoplasm ; and in what respects do these phenomena differ from those exhibited by all known aggregates of purely inorganic matter, or by dead bodies in general ? In order to arrive at clear ideas upon this subject, we may with advantage briefly glance at the phenomena exhibited by a "cytode," by an independent "cell," and by any complex organism, whether animal or vegetable.

What is known as a "cytode" is a minute microscopic mass of protoplasm, which is not bounded by a definite or rigid outer envelope or "wall," and which does not possess in its interior the structure known as a "nucleus." It is in the form of a cytode, or a simple mass of indifferentiated and

non-nucleated protoplasm that the simplest of all living beings present themselves, and it is in the animal kingdom that we find these to occur; the least highly organised plants being so far differentiated as to assume the form of a true "cell." As examples of "cytodes" leading an independent existence we may take the small and often microscopic animals known as the *Monera*, and we may select *Protomyxa* as a type of these. In *Protomyxa* we find the entire organism to consist of an irregular or shapeless mass of orange-red protoplasm, which attains a diameter of as much as half an inch, and has the consistence of jelly. It is found in the sea, floating in the open ocean, attached to the dead shells of oceanic molluscs. The simple, structureless sarcode which forms the body possesses no nucleus, but exhibits numerous vacant oval or spherical spaces, which are, probably, small collections of water taken in during the process of ingestion of the food, and enclosed in the soft protoplasm. At any rate, these "vacuoles," as they are called, are certainly not to be regarded as being in any way of the nature of distinct organs or structures. There is no definite wall or outer envelope to the protoplasm; there is no "nucleus" or central body; and the structure known as the "contractile vesicle" of the higher *Protozoa* is similarly wanting. The structureless being thus constituted is, however, highly irritable, and responds readily to external stimuli, this feature being especially manifest in the method in which food is taken into the body. The ingestion of nutritive matter is effected, namely, by the production at all the free surfaces of the animal of numerous long branched filaments or streams of the soft and diffuent protoplasm, which radiate outwards from the central mass, and to some extent interlace with one another. These prehensile processes of protoplasm can be produced at any point of the surface, and can be again withdrawn, to melt undistinguishably into the soft sarcode of the body, being, therefore, purely temporary and provisional structures. Whenever any particle of nutritive material comes in contact with one of these branching filaments it is seized at once; and by the contraction and withdrawal of the filament, it is securely lodged within the central body-substance, to undergo there the process of digestion. The temporary and adventitious filaments of protoplasm above alluded to are known by the name of "pseudopodia;" and, in one form or another, they are present in all the members of that great group of the *Protozoa*, which naturalists know by the name of the *Rhizopoda*. Beyond the pseudopodia, *Protomyxa* possesses no organs of any kind, and the former have no real title to such a designa-

tion, as they have no permanent existence. There are no digestive organs, no circulatory system, no nervous system, no reproductive organs. As in all living beings, the processes of growth and the maintenance of the body are effected by intussusception and assimilation: that is to say, foreign matter is conveyed from the exterior to the interior of the animal, and is then submitted to certain influences by which it is "assimilated," or made like to the matter composing the animal which it is about to nourish. Finally *Protomyza* has the power of reproducing itself by a process of "encystation," quite similar to what is known to occur in various of the higher *Protozoa*. It is unnecessary to enter here into the details of this process, but it consists essentially in the assumption by the adult organism of a quiescent stage, in which its pseudopodia are all withdrawn, and the protoplasm becomes surrounded by a thick hyaline capsule or cyst. The contained protoplasm ultimately breaks up into a number of minute spherical balls, without any outer envelope, which are liberated by the rupture of the outer cyst, and after a short period of independent life are developed into as many new individuals.

In such a Moner as *Protomyza* we find the very simplest expression of the great equation of life, and, as before remarked, no type of structure so simple and so undifferentiated is to be found elsewhere among animals, or, except temporarily, in the vegetable kingdom. All other animals and all adult plants consist of single or aggregate masses of protoplasm in the form of "cells," properly so called. What is termed a "cell" is, as is well known, a mass of protoplasm, usually of a more or less definite shape, typically spheroidal, enclosing in its interior a distinct vesicular, or solid, variously-shaped body, which is shown by the readiness with which it is stained by carmine to be also of a protoplasmic nature, and which is termed the "nucleus." Such a nucleated mass of protoplasm constitutes a single "cell," and it may or may not be enclosed in a thinner or thicker external covering, which differs in consistence, and often in chemical composition, from the protoplasmic contents, which may be rigid or flexible, and which is known as the "cell-wall."

A single independent cell may alone constitute an individual animal or plant; or an animal or vegetable may be an aggregate of cells, variously disposed, and variously modified; or, lastly, an animal may be an aggregate of cells, of which some form the actual tissues, and have definite places and relations with one another; while others are locomotive, and, from one point of view, semi-independent. We may briefly consider cases of each of these conditions. As an example of the case

where a single individual animal is constituted by a single cell, we may take the *Amœba* or Proteus-Animalcule. This little microscopic creature, so common in water holding organic matter in solution, consists of a minute mass of protoplasm, which does not possess any rigid, well-defined, or unyielding outer investment, but is so far differentiated that it can be clearly distinguished into an outer transparent layer, or "ectosarc," and an inner more fluid and mobile molecular layer, or "endosarc." Not only is this differentiation of the protoplasmic body a distinct advance upon what obtains in the *Monera*, such as *Protomyxa*, but there is now the further feature that there exists in the endosarc a solid granular "nucleus." In addition, also, to numerous fluid-cavities or "vacuoles," we now meet with a permanent internal circulatory organ, in the form of what is known as a "contractile vesicle." This is a little cavity or vesicle, holding a fixed position, filled with a colourless fluid apparently derived from the digestion, and exhibiting rhythmical movements of contraction and dilatation. It may, in fact, be regarded as a rudimentary heart. No mouth is present, nor are there any digestive organs; while the nervous and reproductive systems are wholly undeveloped. Owing to the absence of a hard outer covering, the soft protoplasm of the body is amenable to the slightest external stimulus, and can be protruded from all points of the surface in the form of temporary outward prolongations or pseudopodia, which are used as organs of prehension, and are employed by the animal as the agents whereby it obtains its food. The pseudopodia of the *Amœba* are, in fact, precisely similar in their essential structure and function to the structures known by the same name in the *Protomyxa*, but they are now comparatively few in number, and are blunt and finger-shaped in form. The *Amœba* can reproduce itself either by an actual division of its substance into two portions, each of which ultimately becomes an independent being, or by means of a process of "encystation," and endogenous division, the little sarcode-spherules formed within the parent cyst being ultimately set free by the rupture of the latter to give origin to new individuals.

Nearly allied to the *Amœba* are the wonderful organisms known as *Foraminifera* and *Polycystina*, which among other peculiarities, exhibit the feature that the soft sarcode of the body, undifferentiated as it is, has the power of secreting hard structures of the nature of a skeleton, often of surpassing beauty and not unusually of mathematical regularity. In the case of the *Foraminifera*, which are so abundant in our present oceans, and enter so largely into the composition of the

earth's crust, the skeleton is generally composed of carbonate of lime, while in the *Polycystina* it is of pure glassy flint. The structure of the animal is in both cases very similar to that of the *Amœba*; but the pseudopodia are excessively long and filamentous, and in the case of the *Foraminifera* they largely inosculate and interlace with one another, so as to give rise to a regular network, while in the *Polycystina* they usually stand out like rays, without much anastomosis. In both cases, also, there is seen in the pseudopodia a very singular phenomenon, which is not known in the case of the pseudopodia of the *Amœba*, and which has a singular interest as showing the highly irritable condition of undifferentiated protoplasm in certain instances. If, namely, we observe the pseudopodia of one of the *Foraminifera*, or *Polycystina*, under sufficiently high powers of the microscope, we discover that these apparently structureless filaments of sarcode are really largely made up of very minute molecules or granules, which are in a condition of constant movement or circulation, streaming out from the central mass of protoplasm, and then returning again into it. A similar circulation of molecules is well known as occurring in the protoplasm of many vegetable cells, and the movements, though their precise origin and cause are unknown, are probably really of a similar nature in all cases in which they have been noticed. We may conclude, indeed, with much probability, that this cyclosis or circulation of minute particles is a property of living protoplasm in one of the conditions in which this presents itself to our notice.

As an example of a single cell constituting an individual plant, we may select the cell of Yeast plant (*Saccharomyces cerevisiae*). If a minute fragment of yeast be examined microscopically under suitable conditions, it is seen to consist of a vast number of independent rounded cells, each of which may be regarded as a separate plant. Each cell—as can be well demonstrated by staining with carmine—consists of a central mass of living protoplasm, with a more or less clearly-defined internal nucleus, and surrounded by an apparently structureless external transparent layer, or "cell-wall." The cell-wall is composed of the characteristically but not exclusively vegetable substance, *cellulose*, and it is formed by the central mass of protoplasm as a kind of excretion or exudation, being truly in itself more or less entirely devoid of life, and consisting of what Dr. Beale has termed "formed material." The yeast cell imbibes its own proper nutriment by endosmose through the porous wall, which is thinnest in the young cells and becomes gradually thicker with age. It has, further, the power of reproduction by the development of gemmæ or buds

derived from the central protoplasm, and ultimately detached to form new individuals.

Owing to the comparative density and rigidity of its cell-wall, the protoplasm of the yeast plant does not give rise to outward processes, or "pseudopodia," though it may, as above observed, give forth external buds. For the same reason, the protoplasm of vegetable cells in general is usually devoid of any power of thrusting out pseudopodia. Amœboid and moving filaments of protoplasm have, however, been shown by Mr. Francis Darwin* to be emitted from the cells of the glandular hairs of the Common Teasel (*Dipsacus sylvestris*), and to differ in no essential respect from the "pseudopodia" of the Rhizopods. Moreover, it is well known that the protoplasm in the interior of many vegetable cells, though confined by an unyielding envelope, is capable of "rotation" as a whole, or of exhibiting a circulation of granules similar to that seen in the pseudopodia of the Foraminifera. Lastly, in certain of the life-stages of some of the lower plants (*Myxomycetes*) we really meet with wall-less masses of protoplasm, which are capable of thrusting out pseudopodia, and are in all essential respects morphologically similar to *Amœbæ*.

In the case of the higher and more complex plants, as also in the more highly-organised animals, the ovum, or earliest rudiment of the future organism, has invariably the form of a single simple cell, the essential part of which is a central mass of protoplasm. In these cases, however, the unicellular structure is soon lost; new cells are produced in larger or smaller numbers by processes well known to physiologists; some of these cells may undergo considerable secondary modifications, and ultimately the organism comes to consist of an aggregate of cells, all of which may more or less entirely retain their primitive form, or many of which may be highly specialised and developed into various complex tissues. It should also be noted that in addition to the tissues, as ordinarily understood, the body of an animal may contain a great number of cells which float freely in a fluid (the blood), and are not in any direct connection with one another. Lastly, while the cells of the higher animals, as a rule, resemble those of the great majority of plants in having firm walls, which allow of no changes of form, nor of outward protrusion of protoplasmic filaments, there are cases, even amongst the highest animals, in which we meet with wall-less masses of protoplasm, which contain distinct nuclei, and are capable of manifold mutations of shape. The pigment cells of the skin of the frog, of cuttle-fishes, and of

* *Quart. Journ. Microscop. Science*, 1877, p. 245.

various other animals, supply good examples of such cells ; but the most striking instance is that afforded by the "white corpuscles" of the blood. If, namely, we examine the blood of man, or of any of the higher vertebrates, under a sufficiently high magnifying power, and with suitable precautions, we shall observe that it contains floating in it a number of minute masses of naked protoplasm, which are provided with a nucleus, but are destitute of a proper cell-wall. These are the so-called "white corpuscles," and they are now well known as exhibiting the surprising phenomenon that they throw out external filaments, or processes of their own protoplasmic substance, which can be thrust out at any point of the surface, and can be again retracted, and which precisely resemble the "pseudopodia" of such a Rhizopod as the *Amœba*. Moreover, not only is the life of the "white blood-corpuscles" in one sense a semi-independent one, but these little aggregations of protoplasm are capable of using the pseudopodia just as the *Amœba* does, not only for locomotion but also for the purpose of obtaining food. Thus, by adding a little vermillion, or aniline-blue, or milk, to a drop of blood, the white corpuscles can be observed under the microscope to take in the particles of these substances by means of the pseudopodia, and then in some cases to discharge them again, in a manner precisely similar to that observable in the *Amœba*.

Before proceeding further it should be noted, that all forms of vital activity, of whatsoever nature, are attended with a certain disintegration and destruction of the living matter, or protoplasm, of which the organism is composed. In the case of the microscopic unicellular organisms, this constant destruction of life-matter can be inferred rather than actually demonstrated ; but in the higher animals and plants it can be shown that the vital processes resolve themselves, roughly speaking, into the constantly-proceeding destruction of old cells, and the corresponding production of new cells to take the place of the former.

Having now considered some of the principal forms in which protoplasm presents itself for our examination, and some of the chief phenomena which it manifests when alive, we may here briefly summarise the essential phenomena manifested by all living bodies, as opposed to those which are dead.

1. All living beings may be regarded as essentially larger or smaller aggregates of a substance of extreme chemical complexity, which is, during life, in a condition of continual flux and constant change affecting its minutest parts. In

spite, however, of the excessively unstable chemical equilibrium of living protoplasm, the living body is enabled to maintain its stability and its average condition for a longer or shorter period, which is normally constant, or approximately so, for each organism. This is due to the fact that every mass of living protoplasm has the power of taking in from the exterior certain foreign materials, and of "assimilating" these, or of converting these into new protoplasm capable of replacing the loss and destruction of this substance due to the act of living. In this connection, however, we must notice the remarkable fact that the assimilative powers of vegetable and animal protoplasm differ in a very remarkable manner. Thus the protoplasm of plants, when associated with the green colouring-matter known as "chlorophyll," has the power of decomposing carbon dioxide in the presence of sunlight; and all plants possess the power of building up new protoplasm out of the inorganic substances, ammonia, carbon dioxide, and water. On the other hand, no known animal can thus synthetically construct protoplasm out of merely inorganic materials, but all require to be supplied with ready-made protoplasm as food. The true significance of this fact cannot, with our present knowledge, be rightly estimated; but it is deserving of especial notice, as showing that though the protoplasm of animals and that of plants are, so far as we know, structurally and chemically identical, there nevertheless exists a vast and most important difference in the vital functions which each is able to discharge in the economy.

2. All masses of living protoplasm, whether these are independent organisms, or form parts of an organic whole, have certain *active* relations with their surroundings. This is especially seen in the power of *movement* exhibited by protoplasm in all its forms (when free to move) in response to certain external or internal stimuli. This "irritability," or the power of *actively* responding to stimulation, is a feature entirely confined to living protoplasm, and is not exhibited by any of the multifarious forms of dead matter, all of which are *passive*, and merely exhibit appropriate *reactions* when influenced by external forces.

3. Lastly, living protoplasm has the unique power of reproducing itself by the process of detaching a portion of its own substance, which, under suitable conditions, will become developed into a new living being, resembling that by which it was originally given off.

Having now briefly glanced at the principal phenomena

manifested by living matter, we may next consider what we actually mean when we speak of "life" or "vitality;" and this, though apparently a simple matter, is really one about which considerable differences of opinion have prevailed. As for definitions of life, many such have been framed by eminent philosophers, and would be quoted if any advantage were derivable therefrom. As an old definition we may take that of Treviranus, who defines life as "the constant uniformity of phenomena with diversity of external influences." As a modern definition that of Mr. Herbert Spencer may be selected, who considers life to be "the definite combination of heterogeneous changes, both simultaneous and successive, in correspondence with external coexistences and sequences." When we come, however, to examine these and other short definitions of life, we shall generally find that they practically amount to stating, in terse phraseology, that life or vitality is the sum of the phenomena manifested by a living being; in other words, that life is life. It appears to me, however, that there is, or ought to be, in any satisfactory definition of life, the underlying conception that life is something more than the mere sum of the *phenomena* of a living being; and that it is, in fact, the *force* or *aggregate of forces* to the operation of which these phenomena are due. Life, in fact, is the force or group of forces in virtue of which protoplasmic matter, under given conditions, passes through a succession of changes, which correspond with, and are determined by, internal and external impressions, and follow one another in a more or less definite and determinable sequence.

Leaving, however, short definitions on one side, we may see what more particularly are those phenomena of living beings in virtue of which we ascribe to them the possession of "life," and distinguish them fundamentally from all forms of dead matter. So far as this point is concerned, it is at once evident that a living body is only thereby distinguishable from a dead one that it performs the three great physiological functions previously enumerated; or that, at any rate, it has the *power* of discharging these functions under appropriate conditions and stimuli. Every living body nourishes itself, and maintains its existence as an individual, in spite of the constant destruction of the matter of which it is composed. Every living body has certain active relations with the external world. Every living body can reproduce itself. It cannot be doubted, however, that the most striking phenomena of a living body, or at least those which are most obviously opposed to what we see in merely dead matter, are those which arise from its having active

relations with its surroundings. Upon this subject Treviranus* expresses himself as follows:—

“Under the term ‘life’ we form for ourselves a conception of a condition of activity. We speak of an animal or a plant as being ‘living’ so long as we can still detect in it signs of growth and movement, and therefore of activity. But at the same time we conceive of this activity as being something which originates in the body to which we ascribe life, from the interior and not *ab extra*. The sea, when disturbed by storms, also exhibits activity, but we do not for this reason ascribe ‘life’ to it. We do not do this, because its every movement is the result of the application of an external force. Every movement, then, which originates in extraneous forces and is merely imparted to the body, we term a ‘mechanical’ movement; and those movements which occur as the manifestations of life, are distinguished from those which are merely mechanical, by the fact that they find their starting-point in internal and not in external causes. Easy, however, as it may appear at first sight to separate mechanical from vital movements, nevertheless a closer examination shows us that the above-mentioned ground of distinction is an insufficient one. If the living body were an entirely isolated system, which contained in itself the source and spring of all its movements, then, certainly, it would be easy to draw the line between mechanical and vital movements. But, all the manifestations of vital activity are products of an interaction between the living body and the outer world, and this is precisely the case also with mechanical movements. A mass which has been set in movement by an external impulse, does not less react against the impelling body, than does the muscle-fibre against the stimulus which calls forth its contractility. What, then, is the distinctive character between the interaction which gives rise to the mechanical movement, and that by which the vital movement is originated? In this lies the first of the difficulties which we have to combat in forming a conception of life.”

It is not necessary to pursue further the line of argument indicated above. For our present purpose, it is sufficient to assume that all bodies in a state of active vitality are characterised by their power of maintaining a stable condition in the face of the agencies whereby their substance is constantly being disintegrated; that they make certain active responses to external and internal stimuli, and have other than merely passive relations with the external world; and, lastly,

* *Biologie*, vol. i., p. 16. 1802.

that they can detach portions of their own substance which may be developed into new individuals. How, then, do we explain the fact that living bodies exhibit these phenomena, so different in their essence to anything observable in dead matter? In other words, what is the nature of "life," and what is its connection with the matter by which it is manifested?

In dealing with this question,* we have two classes of theories to consider—namely, the *physical* or *material*, and the so-called *vitalistic*. It is not meant by this that there are only two theories commonly held as to the nature of life, but simply that all existing theories, however diverse, may be reduced to one or other of these categories. First, as to the *physical theories*. The ordinary physical phenomena of matter appear beyond question to be due simply to movements taking place in the ultimate molecules of which matter is composed. These movements may vary in amount and in kind, and may thus give rise to the most diverse phenomena, but they are all essentially of the same nature. Hence, so far as dead matter is concerned, there is no impropriety in saying that force is simply an *affection* of matter. You *might* have the matter without the force; but you cannot have the force, or its resultant phenomena, without the matter.

The advocates of the physical doctrine of life stretch this admission beyond the limits here assigned to it, and embrace in its scope all the phenomena of vitality. On this theory all vital actions are reduced to molecular movements of the protoplasm of which the living body is composed. The properties of living beings are asserted to be "as much dependent upon the mere qualities and nature of the material aggregate which displays them, as the properties of a metal, or the properties of a crystal, are the results of the nature and mode of collocation of the atoms of which these bodies are composed."—(Bastian.) On this view, therefore, "Life" is merely a form of energy or *motion*, and the vital forces of the organism are merely correlates of the ordinary physical forces. To put it in another form, the mechanical, chemical, and physical phenomena of the organism are wholly the result of transformations of the *heat* which it receives from the sun, and the *energy* stored up in its *food*.

As opposed to the doctrines of the physical school, we have the views held by the so-called "vitalists." In its crudest

* The following remarks as to the physical and vitalistic theories of life are taken from the inaugural lecture to the class of Natural History in the University of St. Andrews, delivered in 1875.

form this doctrine was held by the ancient philosophers of Greece, who believed that life was an independent principle, capable of being added to and again removed from ordinary matter. Later, it was held that in some central spot in the living organism there existed some kind of guiding, directing, and all-pervading power, or "vital principle," capable of "influencing all the organs and tissues of the body in much the same way as the master builder controls and directs the operations of his workmen."—(Beale.) Later still, again, it has been held that there is inherent in the protoplasm of the *living* body a peculiar power, which, for want of a better term, may be called "vital force," and which disappears from the organism when death takes place. This power is supposed to be in association with every particle of living matter, and is believed to be independent of the correlated series of physical and chemical forces. It is asserted to be superior to the ordinary forces of the universe in *kind* and *order*, and to control and regulate these. There is thus no reason to regard it as a mere "aspect" of matter, or as necessarily ceasing to exist when separated from the material substratum with which alone we know it to be associated.—(Beale.)

The vitalistic doctrine of life admits of various modifications and diverse reservations; but all forms of this doctrine agree in believing that there exists in the living organism something which is not merely a form of one of the ordinary physical or chemical forces, but is superior to these. On the other hand, all modifications of the physical doctrine of life agree in believing that the forces displayed by the living body are nothing more than the ordinary correlated forces of the universe in another form.

We may now compare these theories a little more minutely. In the first place, it is to be at once admitted that a large proportion of the phenomena exhibited by every living being are clearly physical and chemical, and are therefore due to the action of the ordinary correlated forces. Here is where the real difficulty of the case arises. It is impossible to deny that *many* of the actions of animals are purely or mainly physical and chemical. The point is—are *all* the actions of the living organism of this nature, or are *some* of them due to something else, distinct from the physico-chemical forces of the correlated series? Every one acquainted with the modern doctrine of the "conservation of energy" will admit at once that the mechanical and chemical forces of the organism are derived entirely from the transformation of the ordinary physical forces. Digestion is carried on by a modification of ordinary chemical affinity. Animal heat is derived from chemical com-

bination. The force with which muscular movements are effected is derived from the energy stored up in the food on which the animal lives. All the forces of our globe, of *this* kind, are derived from the sun, and in *this* sense we may safely accept Tyndall's dictum, that our future Shakespeares are "potential in the fires of the sun." If we have no sun, assuredly we shall have no Shakespeares, for life can only be carried on by the transformation of energy primarily derived from the sun. So far, the advocates of the physical doctrine of life are clearly correct, and stand within their rights. The question, however, is whether *all* the energies of plants and animals are either chemical or physical? and to this question an answer in the negative may be safely returned. On this point the advocates of the vitalistic doctrines are fundamentally right, if not right in details. Animals and plants exhibit phenomena which can *not* be explained simply by reference to the known chemical and physical forces of the universe.

As has been more or less dimly discerned by many investigators, and has been specially insisted upon by Mr. Croll,* the real problem is not as to the *nature* of the molecular movements of protoplasm which give rise to vital phenomena, but as to the nature of the cause which *determines* these movements. Indeed, the same may be said of the molecular movements of matter which constitute the ordinary physical and chemical forces of the universe. Heat, electricity, magnetism, and the like, are merely different kinds of movement taking place amongst the same particles of matter. The fundamental question is not "What is the particular force in action, or upon what does its exertion depend?" but rather, What is it that causes the force to act in the particular manner that it does act?" It is quite true that the human mind is incapable of conceiving of force as acting *at all*, unless as acting in a particular *direction*. The force cannot be *produced* without at the same time being *determined* in space and in time; but what accounts for its production will not account for the direction it may take. The explosion of the gunpowder is a sufficient cause for the movement of the bullet, but it is clearly no cause for the bullet travelling eastwards rather than westwards.

Here we appear to reach the kernel of the matter at issue. The living organism, however simple, constitutes a system or vehicle for the action of the chemical and physical forces of

* "What Determines Molecular Motion?—the Fundamental Problem of Nature," James Croll, *Philosophical Magazine*, 1872. A most admirable and thoughtful disquisition on the determining causes of the molecular movements of both dead and living matter.

the universe. We can account for the existence and ultimate constitution of these forces, no better, and no worse, in the case of the living organism, than we can in the case of ordinary non-living matter. The sole question is—Do these forces act in the living organism otherwise than they do in dead matter; and, if so, what is it that causes this different action, and *determines their direction?*

That the physical and chemical forces act differently in the living body to what they do in dead matter seems to be sufficiently proved by the fact, that whilst the matter of life ("protoplasm") is apparently identical in composition in all living beings, the vital phenomena exhibited are of the most varying character. No one can produce any adequate distinction between the protoplasm of a man and that of a sponge; but no one will deny that the vital phenomena exhibited by these organisms are of an extraordinarily different nature. With identity of force, and of the vehicle through which that force acts, we have therefore a marvellous diversity of results, and this diversity can only be due to differences in the cause which *determines* the molecular movements of protoplasm.

The advocates of the physical theory of life have endeavoured to evade this difficulty by assuming the existence of an inherent "*directive force*," either in the protoplasm itself, and constituting one of its natural properties, or in the "*sun-force*" which that protoplasm receives, directly or indirectly. We hear a great deal about "*molecular organisation*," "*atomic machinery*," being "*built up by sun-force*," "*formative power of matter*," and the like; and these, as Fluellen has it, are indeed "*prave 'ords*"; but they are nothing more than words, and a little observation and reflection will show us the fallacy of all this. Given a steam-engine and coals, you still require something to direct its action, and you cannot find that something in the dead machine or in the fuel. You get a certain amount of "*power*" or "*force*," but that is all; and you may use that power in an almost infinite variety of ways by *directing* it in different directions. It is only a *man*, however, who can determine the course which the power of the steam-engine shall take. To use a somewhat similar illustration of Dr. Carpenter's, you may go to any large manufacturing town, and you may hire or purchase a room "*with power*," as the phrase goes. What is it that you buy in such a case? Surely you do not purchase the power to do any particular thing, such as to weave cloth or to print books? On the contrary, you simply buy so much bare *force*, and it is for *you* to direct that force by suitable machinery into any

channel that you may wish, and thus to render it available for the special purpose you may have in view.

When the advocates of the physical theory of life speak of protoplasm assuming the marvellous forms of organised beings by means of an inherent power of its own, they are employing a scientific fallacy. It is all very well to tell us that the forces which reside in living protoplasm are but the forces, physical and chemical, that rule amongst the particles of dead matter, and are therefore derived from the sun. So they are; nobody would think of denying it. The question to be solved is simply whether these forces constitute *all* that exists in living protoplasm, and to which its vital activity is due? The supporters of the physical theory of life say that they do, but in so saying they are proceeding upon the most improbable of assumptions. The vital phenomena manifested by even the simplest mass of living protoplasm are out of all proportion in extent and variety to the external stimuli, which form the starting-point of most of these phenomena; and the same stimulus may give rise to very different phenomena in different masses of protoplasm, or in the same mass at different times. As has been well pointed out by Mr. Croll, however, nothing could be more unfounded than the assumption that the power which *directs* the molecular movements of protoplasm in one path rather than another, is itself the very molecular movements in question. When protoplasm is said, by its intrinsic "directing power," to determine the motions of its molecules, and force these into certain paths or modes of motion, we are practically told that the *production* of force and the *determination* of force are the same thing, and that the action of a force can be determined by the same force. Without entering into the argument on this point, it may be said at once, however, that it can be logically demonstrated that "the production of motion and the determination of motion are absolutely and essentially different," and that "the action of a force cannot be determined by a force, nor can motion be determined by motion."

Before attempting to come to any conclusion as to the essential nature of life, we may shortly consider one or two further points as to the connection which has been supposed to subsist between life and its physical basis or protoplasm, and also the extent to which vital phenomena may be supposed to be connected with *organisation*. As regards the first of these subjects, high authorities have at the present day declared themselves in favour of the view that life is merely a *property* of protoplasm. In other words, it is asserted that life is the result of the combined properties of the elements which unite to form

protoplasm, just as the properties of water are the resultant of the combined properties of its constituent hydrogen and oxygen; and it is alleged to be just as absurd to set down the phenomena of life to an assumed "vital force," as it would be to ascribe the properties of water to an assumed "aquosity." Now it appears to me, that in considering such an assertion, there are two important points to bear in mind. In the first place, it seems clear that in speaking of life as a "property" of protoplasm, we are really using a phrase which might admit of more than one interpretation. What in the case of a lifeless body are understood as its "properties," are either certain inherent *qualities* (as learned by our sensations), or else they are certain *reactions*, which are of constant and invariable occurrence whenever the body in question is acted upon in a particular manner. From the point of view here taken, however, life consists of *actions* as well as of reactions, and to speak of the former as being "properties" of protoplasm is simply to beg the entire question at issue; while it may be presumed that even the most ardent advocates of the physical theory of life would not be prepared to assert that life is an *inherent quality* of protoplasm.

In the second place, the assertion that life is merely a "property" of protoplasm, is one which ignores the difference between *dead* protoplasm and *living* protoplasm. Even as regards the phenomena of irritability and contractility—as manifested in the protrusion of pseudopodia by all naked masses of living protoplasm—it is certain that we have to deal with something which cannot be justly spoken of as a property of protoplasm. On the contrary, the manifestations of irritability are in the most obvious manner directly dependent upon the fact that the protoplasm is in that peculiar condition to which we apply the term "*living*." Irritability and contractility are not inherent properties of protoplasm *quâ* protoplasm ; and those who make such an assertion must be taken as maintaining the thesis that protoplasm has no existence in its *dead* state, and that we are only acquainted with it in its *living* condition. Considering, however, that the greater part of our entire knowledge of protoplasm, as an actual substance, is based upon the observation and examination of *dead* protoplasm, that we are still ignorant of its composition as a definite chemical compound, and that there is not a particle of scientific evidence to show that the protoplasm of a dead animal is in any way physically or chemically different from that of the same animal when alive, until, at any rate, decomposition has occurred—considering these things, we may well maintain that the assertion that life is a

"property" of protoplasm is at present wholly unproved, and, upon the face of it, very unlikely.

We may fairly assert, on the other hand, that the phenomena of vitality are due to the fact that living protoplasm is temporarily the seat of forces which do not reside in dead protoplasm; and the *onus* of proving the contrary rests clearly with those who assert that all protoplasm is, *ex hypothesi*, in a state of active or potential vitality. Upon quite as good grounds might it be said that man is composed of some forty chemical elements, combined with water in various proportions, and that the properties of the resulting compound are not only that of digesting, respiring, moving, &c., but also of thinking, speaking, writing books, building ships, and the like. These, however, are the properties—in a loose sense of this word—of the *living* man, in spite of the fact that the dead body cannot be shown to differ in chemical composition from the living one, until a certain period after death has elapsed. All such arguments ignore the effects of *form* and *collocation* as vehicles for transmitted forces.

Again, assuming with modern physiologists and naturalists that the protoplasm of all living beings is essentially identical, it is clear that only such vital phenomena can be said to be "properties" of protoplasm—in any sense, or upon any theory—as are manifested by protoplasm in all organisms and under all conditions. Even then, if we were to admit the propriety of considering living protoplasm at all in connection with such an argument, we should still have to face the difficulty that the vital phenomena of different organisms differ, as one may say, immeasurably, while the protoplasm remains the same. This is an insuperable obstacle to our accepting the theory that life is a "property" of protoplasm; for though a sponge and a man both "live," in the strict sense of the term, there is fixed between the vital phenomena of the two (including their mental processes under this head) an absolutely impassable gulf.

It should not be overlooked, however, that there is a theory first propounded by Dr. Fletcher,* and subsequently developed by Dr. Drysdale,† which would escape the difficulty above pointed out by the assumption that protoplasm really has no existence except in the *living* body. Upon this theory, the living matter of the organism (protoplasm) is not only "in a somewhat different chemical state from that in which it

* *Rudiments of Physiology.* 1835.

† *The Protoplasmic Theory of Life.* 1874.

exists after death," but its constituent elements are "in a state of combination not to be called chemical at all in the ordinary sense, but one that is utterly *sui generis*." In fact, "no albumen, fibrin, myosin, protagon, or fats exist at all in the living matter," but "the sum of the elements of all these is united into a compound, for which we have no chemical name, and of the complex mode in which the atoms are combined we can form no idea; and it is only at the moment of death that those chemical compounds, with which we are familiar, take their origin." It would be impossible here to enter into any further exposition of this ingenious theory, or to attempt to criticise it. As before remarked, it evades the difficulty which has been above pointed out; but it must be noted that it only does so at the expense of having to assume the existence in the living body of an entirely hypothetical form of matter. Whether or not such a matter really exists, it is clearly something very different to that which is ordinarily known as "protoplasm;" and it may, perhaps, be questioned whether it is not, from a philosophical point of view, much the same thing to postulate a form of matter "of the complex mode in which the atoms are combined we can form no idea," as to assume the presence in the living organism of the much-ridiculed "vital force."

It remains only to say a few words as to the supposed relations between life and organisation. It has been commonly assumed that an animal lives because it is "organised," or consists of various definite organs, each of which discharges its appropriate function in the economy. Upon this view an animal is a kind of a machine, and "life" is the product of the working of its parts. Modern naturalists and physiologists are, however, tolerably agreed that though the *specialisation* of the vital functions can only be carried out by a correspondingly specialised set of organs in the animal, the essential phenomena of vitality are manifested by naked, and to all appearances structureless protoplasm. The existence of animals like the *Monera*, which are absolutely devoid of anything which could strictly be called "organisation," but which, nevertheless, discharge all the fundamental functions of life, is sufficient proof that vitality is essentially independent of organisation or structure. Recently, however, it has been maintained by one of our most illustrious naturalists * that the protoplasm of different organisms, though to all appearances identical, is really different in its "molecular constitution."

* Professor Allman, *Inaugural Address to the British Association, Sheffield, 1879.*

Upon this point, Professor Allman observes, that to suppose that "all protoplasm is identical where no difference cognisable by any means at our disposal can be detected, would be an error. Of two particles of protoplasm, between which we may defy all the powers of the microscope, all the resources of the laboratory, to detect a difference, one can develop only to a jelly-fish, the other only to a man; and one conclusion alone is here possible—that deep within them there must be a fundamental difference which thus determines their inevitable destiny, but of which we know nothing, and can assert nothing beyond the statement that it must depend on their hidden molecular constitution. In the molecular condition of protoplasm there is probably as much complexity as in the disposition of organs in the most highly differentiated organisms; and between two masses of protoplasm indistinguishable from one another there may be as much molecular difference as there is between the form and arrangement of organs in the most widely separated animals or plants."

There is, doubtless, much that is attractive in this theory, that the "molecular constitution" of protoplasm differs in different organisms, and that to variations in this respect are due the striking differences in the vital phenomena which they exhibit. Not only is this theory a fascinating one, but it would even find some sort of support in the well known phenomenon of "allotropism" amongst inorganic substances. It must be borne in mind, however, that it is only a theory, and that nothing like positive proof can be brought forward in its favour. If such differences in molecular constitution really exist in the protoplasm of animals and plants, they must be as endless as are the variations in the degree and kind of the vital phenomena which these exhibit, while, in any case, they are purely hypothetical. It should also be borne in mind that this theory is only a revival, in a subtler form, of the hypothesis that life is the result of organisation; for it cannot be denied that "molecular constitution" is only a kind of "organisation" upon such a lilliputian scale that it cannot be demonstrated even by the microscope, and can only be grasped by the "scientific imagination."

In the above connection there is one point which deserves a passing notice. It has, namely, been commonly assumed that as the life of a Moner or a unicellular organism is seated in a single, often microscopic spherule of protoplasm, so a complex, multicellular organism, may be properly regarded as a mere collection of such units, and its life as a mere agglomeration of the functions and activities of these. It is true, no doubt, that in one of the higher animals or plants, each

individual cell or cytode has, in a certain limited sense, and in a certain limited degree, its own independent life, its own period of active existence, its own proper work and function. It is no less true, however, that each and all of the cells of a compound and complex organism draw their life from that of the whole. To assert that the life of a higher animal is the mere added-up total of the lives of the component cells which form the individual, is to entirely ignore the all-important effects which flow from collocation and relative arrangement. Just as well might we assert that there is no difference between a heap of bricks and a house, or that a statue is nothing more than a block of marble, *plus* the aggregate mechanical energy of the blows of the sculptor with his mallet. Moreover—and here we touch the root of the matter—collocation would alone be powerless to produce the varied and wonderfully complex vital phenomena of the higher organisms, and cannot but be itself the result of some directing and unifying power, which we must suppose to be present, in greater or less degree, in all forms of life.

What, then, is this directive force? It is the old "vital force" of the vitalists, but the title is a bad one, and has necessarily led to much and inevitable misconception. No scientific observer at the present day can accept the assumption that there exists any peculiar physical force which can be added to and again taken away from matter, and upon the presence or absence of which depends the animated or lifeless condition of the organism. No scientific observer, further, will feel disposed to deny that a very large number of the processes which go on in the living body, and which have usually been called "vital," are really the result of the ordinary physico-chemical forces modified by the peculiarities of the medium through which their operation is determined. At the same time, I, for one, find it impossible to believe that all the so-called "vital" phenomena of even the simplest of living beings depend upon the action of the known physical and chemical forces upon the peculiar kind of matter which we term "protoplasm." In all living beings, I must assume the existence of some directing power, which, after all, is no more hypothetical than is the supposed peculiar "molecular constitution" of Professor Allman, or the complex chemical constitution, of which "we can form no idea," of Dr. Fletcher and Dr. Drysdale. When we come to think of the vital phenomena of the *higher* animals, I hold the hypothesis of an inner directing power to be absolutely inevitable; but if we admit such an idea for man, we must equally admit it, with the necessary modifications, for the Moner. I will not use in

this connection the well-worn and much abused terms of "material" or "immaterial," in speaking of this admittedly inferential directive power in the organism. Professor Tyndall has demanded recognition for a very similar or identical agency under the name of "formative power." Besides, it is for the physicist to give some definition of "matter" which is not based simply upon its *phenomena*, before he is entitled to demand that one should define that which is *not* matter. I cannot, however, fail to recognise that there exists in every living being some actual force independent of and superior to the protoplasm of which its substance is composed. By this force all the activities of the living organism are controlled and directed, and we must suppose that it differs in degree, if not in kind, in different organisms. To designate such a force as "vital" is but to use a term which we cannot philosophically define; but of its actual existence we can nevertheless have no doubt. It is, in fact, the indwelling *psyche* which forms the real essence of all forms of living matter, from the humblest alga up to man himself, and without which "life," in its proper sense, would have no existence. What may be the essential nature of this *psyche*, how far it may differ in fundamental constitution in different organisms, and in what manner it is united with the protoplasm of the material body and is enabled to influence this, are questions which, if answerable at all, belong to the domain of the psychologist and not to that of the naturalist. If, however, it can be shown to have a real existence, then we shall have accomplished a part of what I hold to be one of the most pressing duties of the present generation, by linking on, so far as may be, the clear-sighted scientific knowledge of to-day to the elaborate and often self-evolved theories of the past, retaining what may appear good in these, and welding them into a homogeneous whole with modern ideas.

The CHAIRMAN.—I am sure we are all much indebted to Professor Nicholson for the very valuable paper he has sent to us, and we can only regret that it has been impossible for him to read it in person, in consequence of his being obliged to be at Edinburgh University taking the duties of Sir C. Wyville Thomson. All will concur in thanking Mr. Gorman for the very clear and able manner in which he has read the paper. (Hear, hear.) Those present can now offer any remarks upon the subject of the paper.

Mr. J. E. HOWARD, F.R.S.—I am glad to be able to give a general assent to the conclusions of the writer of this paper; but could have wished that in giving a sketch of the fundamental phenomena manifested by living beings, he had not shown so much deference to the palpably false statements

of some modern writers. In order to form a true conception of these, it is necessary to scrutinise very closely the terms which they employ. The definitions of *protoplasm* involve this fallacy, that whilst spoken of as one thing or substance, it is at the same time, according to the same authors, many things or substances, to which the same remarkable, and indeed incredible, properties are attached. As if we were to say that "clay" was a substance universally admitted to produce bricks, and also potter's-ware and porcelain : and, ignoring the brickmaker or the potter (whilst theorising further on this fundamental basis of brickmaking), were to conclude that without possessing any actual structure in itself, it manifested brickmaking properties, or porcelain-producing properties, by virtue of its being "brought from a statical into a dynamical condition."

If we apply to the brickmaker, he would tell us that our definition of "clay" (to begin with) was very imperfect ; and that, without having at his disposal a mixture of various earths (best known to himself), "with water, and a variable amount of mineral substances in addition," he could not produce *bricks* at all. He would further inform us, that "molecular movements" had never come within the compass of his observation—that, on the contrary, much horse or donkey-power was needed to effect the mixture. As to any inherent properties of the "clay" to form itself into bricks, he would be lost in wonder whether you were after all sane, or whether much learning had made you mad.

Turning to the porcelain manufacturer, he would tell us that "clay" might very likely be well described (see Johnson's Dictionary) as an "unctuous and tenacious earth, such as will mould into a certain form," but that the term could only be very loosely used of the "highly complex" matter which would alone serve his turn. After showing you the elaborate contrivances for preparing the material, he would let you see the workmen engaged in the various manipulations of his art, and would probably acquaint you with the difficulty he found in causing his plans to be perfectly carried out by his men. He would then show you his designing-rooms, and perhaps say, "I flatter myself that I have here in my employ the most perfected taste and the highest skill that can be met with in the trade ; but it is astonishing, and you would scarcely credit, how highly I have to pay for all this *mind* employed in my service."

Now, if we consider Nature, we find that she makes her bricks so economically as never to lose any part of her material—turning everything to account. She is never disturbed by adverse combinations of her under-workmen nor troubled with their insubordination.

But, as a porcelain-maker, she is unrivalled ; for she can communicate to her little lumps of soft sarcodes (undifferentiated as they are), (p. 274), the power of secreting hard structures formed out of *chalk* or pure glassy-flint of surpassing beauty, and not unusually of mathematical regularity. To what schools she sends these sarcodes to acquire this *perfection of taste* and this *fondness for mathematical regularity* we are not informed ; but can at all events display our wisdom by calling them *Foraminifera* and *Polycestina*.

As to the God that made them we do not recognise His existence, and are ignorant that professing themselves to be wise, certain persons became *fools*, which is a name likely to last as long as the scripture from which it is taken and is the proper distinctive term to be applied to *us*, if we are guilty of such egregious folly.

Admitting that life ordinarily requires for its manifestation that great group of organic compounds which are known generally as the nitrogenous or azotised substances, and that these more or less closely approximate to albumen in chemical constitution, we may (if we like) apply the term *proto-plasm* with the same amount of accuracy (or inaccuracy) as in the former case we use the word clay. But take away *life* and you have nothing but a *caput mortuum* as a residuum. The carbon, hydrogen, oxygen, nitrogen, the iron silica, &c., are all there, but there is no longer any power of organization. The brickmakers, the porcelain-makers, the designers, are all gone and Nature takes care that this refuse shall be disposed of in other ways.

“ Imperious Cæsar, dead and turned to clay,
Might stop a hole to keep the wind away.”

The albumen and proteine substances in an egg illustrate this part of my meaning. Every one knows that they are *not* dead refuse matter; although unless quickened into independent life they speedily *become* so, and are resolved into other chemical compounds. And the *life*, whence comes it? Certainly not from some inherent “molecular movements of extreme chemical complexity!”

I have shown in my “Addendum to the Contrast between Crystallization and Life” how this subject is intentionally mystified, for the object of maintaining the doctrine of *evolution*; and how, whilst it is admitted that the cell theory is misleading, it is again and again brought to the front. To assert a fallacy and to re-assert it, in spite of all argument which *cannot* be faced but *must be ignored*—this passes for *science!* And we must get rid of *fanaticism* in *science* as well as in religion, if there is to be any reconciliation between them; for in all cases fanatical adherence to a system leads to a want of truthfulness of statement, and whilst it enlists partisans destroys all accuracy of research.

I cannot but regret that in the midst of so much that is excellent, as a *résumé* of the present state of scientific knowledge, Dr. Nicholson should have failed to define a more striking point than any of the three which he has recorded (at pp. 277, 278) in discussing the essential phenomena of all living bodies as opposed to those that are dead.

Kant has well said that “the cause of the particular mode of existence of a living body *resides in the whole*”; and Müller, that “there is in living or organic matter a *principle* constantly in action, the operations of which are in accordance with a rational plan, so that the individual parts which it creates in the body are adapted to the design of the whole—and *this it is which distinguishes organism.*”

It is this principle, residing in the whole, to which our author gives the
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name of *psyche*, to which I by no means object,* but on the contrary gladly take it as the basis of what I have further to say, with this preliminary observation, that we have here passed the bounds of all possible scientific investigation ; seeing we have to do with that which is not ponderable or visible, nor can in any way be brought within the cognizance of our senses. The mind can only grasp it as a living *idea* caused to inhere in each organism, and to build up and maintain that organism according to the preconceived plan of the Creator.

How else can we explain the phenomena of life ? How conceive of the possibility of its commonest manifestations ? Why should a crab, which has lost its claw, reproduce a crab's claw rather than a human hand ? The notion of the infinite variety of created things arising from the qualities of protoplasm is (as I have shown) absurd ; and, moreover, this variety is produced (as Huxley has so well shown †) as if by an invisible artist shaping the organism from the very commencement according to its "kind"; "fashioning" in continuance its members when as yet there was none of them ; and in the meantime, leaving tokens in each case of the links which connect each individual with the grand whole ; so that all is shown to be the evolution of the harmony existing in the infinite Λόγος or Word, of which all creation is but (as it were) the expression.

The *psyche*, whilst it inheres in the organism, dominates and turns to its own end all chemical forces. Take away the *psyche* and in the moment all is reversed. The torch no longer burns but is at once extinguished.

I may add that according to the belief and experience of mankind in all ages, this *psyche* is not necessarily dependent on or even connected with *protoplasm*.

In propounding the opposite doctrine, contrary to all evidence, *Positivism* proves itself an Impostor, and should be dealt with accordingly.

Rev. C. L. ENGSTRÖM.—The Rev. J. H. Barker has asked me to read the following communication ; the views are his own, and, as only the reader, it is unnecessary for me to say whether I agree with them or not :—

" While I fully acknowledge the formidable difficulties surrounding the subject of this able and interesting paper,—difficulties which might well deter any but the acutest intellect from attempting to grapple with them,—I may yet, as one of the oldest members of this Institute, claim the privilege of making a few remarks upon it. The mystery of *Life* is a subject upon which I have bestowed much thought ; and I entirely concur with the author of this paper, that the solution (or even partial solution), of the problem 'is one of the most pressing duties of this generation.' I would begin by expressing my conviction that it is hopeless to expect to

* But, if we have *ψυχή* feminine, we must also have *ἴδιος* masculine, or our *Ίδια* (being thus differentiated in nature), would be incomplete. The French term "*pouissance formatrice*" is liable to no such objection.

† See "The Contrast between Crystallization and Life," *Transactions*, Vol. VIII., p. 194.

arrive at any satisfactory conclusion in the matter, without a vast extension of our ordinary notions as to the *variety* of creation in two particular directions :—(1) As to the extent to which the imponderable or ethereal forms of matter are involved in the structure and functions of living things ; and (2) As to the existence and almost boundless variety of *psychical entities*, as forming constituent parts of *animal* organisms, the latter being more strictly than the former individual *creations* ; but both, of course, products of the same Infinite Power and Wisdom, and formed to carry out the purposes of His beneficence. In a matter of this kind, hypothesis is unavoidable ; but, as it has been well observed, hypothesis, if duly guarded, is a necessary and most useful precursor of ascertained truth. And the supposition that a “world of mind” exists, having at least as wide a range as that which science recognises as the world of matter, is one which is in perfect harmony with the patent facts of our own consciousness, and of our surroundings.

“After specifying two classes of theories on the subject of Vitality, Dr. Nicholson points out (p. 283) the importance of distinguishing between the *production* and *direction* of *force* in living beings, and that what accounts for the one does not necessarily account for the other. He had just before granted to the advocates of the materialistic theories, that *many* vital phenomena are due to ordinary physico-chemical forces, but denied that *all* could be so accounted for. This truth (which rescues us from being reckoned as mere pieces of machinery) may, I submit, be best explained upon a principle which I strongly hold,—that *all* force is, properly speaking, the *acting of will* ; and that we have here the simultaneous and concurrent action of *two* wills, a higher, which originates and directs the force that produces the physical and molecular motions, and a lower (created) mind and will, which has been endowed with a limited control over, and direction of, the physical forces of matter, whether gross or ethereal. The term ‘created mind’ here used I regard as equivalent to the author’s *psyche* (p. 291). It is not necessary to suppose that this mind is always *conscious* of its own actions, or that it always acts from purpose. This cannot be said even of the *human* mind. And though to draw a distinct line of demarcation between the operations of the two forces, the *physical* and the *psychical*, is clearly beyond our power, this does not forbid the recognition of both as factors in vital movements.

“To refer, then, only to theories alluded to in the paper before us:—the author points out (pp. 269, 270) the absurdity of assuming the identity of the chemical characters of *living* and *dead* protoplasm, and the fallacy of arguments based upon this assumption. And this, coupled with the obvious fact that no proof has been, or indeed can be, given, of the chemical condition and composition of *living* protoplasm, entirely vitiates many of the conclusions of the materialistic school of philosophers.

“Mr. H. Spencer’s definition of ‘life’ (p. 279) as ‘a combination’ of certain phenomena, is quite inadequate, because it specifies no producing cause for the combination. Mr. Bastian (p. 281) places all vital action on the level of chemical and mechanical phenomena. But does this writer undertake

to tell us what is the originating and directing power in these *latter* phenomena? What if they are to be ascribed to the constant working of the 'higher Will,' both as to the production and direction of these forces, while the former include the action of the *psyche* also? And even if it be admitted, that the hypothesis alluded to in this connexion,—viz., that vital force is a transformation of solar energy 'stored up' in vegetation, and thence transferred to the animal system,—is as true as it appears to me doubtful, this would only remove the vivifying power a step or two back, and virtually lodge it in the hands of Him who makes the sun to shine.

"As to the now fashionable doctrine of the *storage* of solar energy in food and fuel, based, as it appears to be, on the analogy of *potential* force latent in a bent metallic spring, or in a condensed volume of elastic gas, the two cases are so different, that they do not admit of comparison. It appears to me that according to the theory referred to on the first part of page 282, 'life' is a power associated temporarily with matter, superior to physical and chemical forces, and controlling them, and not necessarily ceasing to exist when separated from matter. This comes very near to the idea of a 'psychical entity, distinct from matter,' and approximates closely to Dr. Nicholson's *psyche*. For while at p. 283 he calls the living being 'a vehicle for the action of the chemical and mechanical forces of the universe,' at p. 290 he speaks of 'mere *collocation* of materials as being wholly powerless to construct definite organisms; this very *collocation* being itself the result of some directing and unifying power, which we must suppose to be present in a greater or less degree in all forms of life.'

"A little further on he considers the hypothesis of an inner directing power inevitable, 'alike in man and in the Moner.' These large results, however, can hardly be ascribed to the *psyche*. I think, therefore, we must understand the Professor as admitting the presence of *one Power* alike in all organisms, viz., that of God. I would add that this would also be a sufficient answer to Professor Tyndall's demand for an agency, under the name of 'formative power.' The presence of such a power (using the term in its concrete rather than its abstract sense),—the presence of such a power does not, of course, forbid the exercise of *will* on the part of the living beings. They are, doubtless, quite compatible, within the limits assigned to the *psyche* by its Maker.

"The case of vegetable life is so far simpler than that of animals, that no *psyche* can reasonably be predicated as dwelling in plants; and yet something like it is found there also, which seems, at least, to control the chemical and mechanical forces of Nature. But is this a necessary deduction? May it not with equal reason be inferred, that in this department of living nature, the *only will* concerned is that of the great Ruling Mind? For the purpose of clothing the earth with plants in all their beauteous variety, and providing food for the animal world, that Supreme Will forms from dead matter the definite compound we call protoplasm, employing ethereal agencies in the construction and development of all their tissues and varied products; and their life or death is the continuance or cessation

of that action in any cell, or aggregate of cells, which form an individual plant.

"Here, as in the case of animals, only to a far greater extent, the life and development and variation of plants, are placed by the Creator within the power of man, not to originate a single living atom, but only to modify (within certain limits) the results of the various processes.

"Thus, after all, the life both of plants and animals, must be ultimately traced to Him who is 'the Author and Giver of life.'"

Professor O'DELL.—I regret that I had not the advantage of seeing a proof of Professor Nicholson's paper before I came here, as I should then have been able to have discussed it better. Nevertheless, I think the whole matter lies in a nutshell, the pith and marrow of the question being simply—Is there life independent of matter? We need not go to inferior organisms for the answer; let us seek it in ourselves. I will give a very simple illustration, which I think will prove that life exists independently of matter and of mind too. You put your fingers on the keys of a piano, and, being a good and perfect player, you produce most excellent and harmonious music. Stand away from the instrument, and it is to all appearance quite dead: there is no music there; no manifestation of harmony. But does that prove that you are dead? Does it prove that you have ceased to exist? By no means. Well, it is the same with the human mind. There is the body and there is the brain, and if the brain does not manifest its power and thought, its reflective and perceptive abilities, it is not because the mind is dead, but that it has ceased to act upon the corporeal body. It cannot be proved that the mind* is dead because there is no manifestation of the mental abilities. I will give you another illustration. Take the same piano, unstring it, or damage it in some way. Let the same pianist try to play upon it, and the result is that you hear the most inharmonious sounds. Do you say the pianist is affected? By no means. You have the same pianist, with the same ability; but he does not produce the same sounds. So if any of you should meet with an accident, or be thrown upon a bed of sickness: you are living, but you may not manifest intelligence,—the mind still exists, though you may only manifest such an amount of intelligence, or want of intelligence, as you would look for in an idiot. I think these illustrations will suffice to show that the mind may exist quite apart from the body, and quite independently of any material existence.

Dr. HOGGAN.—It is always a hazardous thing to attempt to criticise the writings of so scientific a man as Professor Nicholson; but all I have to say is in the same direction as he has gone himself. I desire to direct my observations especially to one theory which is receiving general support at present amongst our greatest minds, namely, that life is merely the sum total, as expressed by Professor Nicholson, of the vitality of individual cells—in other words, that it is simply organisation in action. Now, we know very well, that in the human body we have really two different forms of life

* Soul or life.

represented—namely, the life we speak of as “the spirit,” and the life which each individual cell has for itself. But if life is merely the result of the vitality of all these individual cells, it ought, if all these cells remain in action, to be maintained in the body after what we call death. We know, however, that this is not the case ; although a man dies, all the cells in his body may still retain their individual life. We can prove this in many ways. Half-an-hour after death we can electrify the nerves so that a stimulus may be conveyed to the muscles, and they will contract and exhibit the same sort of action that is going on in life. Again, if we take the cells, with proper precautions we may see them working as rapidly and with as much life as ever, although the spirit has left the body for ever. It is evident from this that the vitality of the cells of our body is not our life ; and if we reverse the matter, we may say that the cells can live independently of the original life by which they were produced. Suppose we go to a surgical operation. We can take the skin from a man’s arm and use it on a patient who requires a new nose, whereby we may grow a million of cells in what is taken from the body of one man and transferred to that of another. Here, you will see, there has been a complete change, the living cells taken from one person and transferred to another, being not entirely dependent on one life for their life. Doubtless the individual cells die a certain time after life has left the body, just as if we had a pet canary that was left without the necessaries of life, and died in consequence ; but when transferred, as I have pointed out, they live and manifest all the phenomena of life. It would, however, be ridiculous to say that their life is the result of the sum total individually of our own. If we endeavour to find out what it is that keeps those cells in life, it is in reality the food we take. After a certain time, when food is not supplied, they die as the canary does when it is neglected. But if we wish to find out what is the nature of the directing force of which Professor Nicholson speaks, we find that we can really form no conception of it. It is spoken of as a “force” or “power”; but I do not think that these are the terms to apply. It is, in fact, merely an agent, just as the wind is an agent to blow away a straw or the dust. It is the Creator who stands behind and originates the directing power. We see but the phenomena connected with matter. We know that the earth and the planets are moving in their prescribed cycles, and that they have done so for ages, and we speak of such things as due to repulsion and attraction ; but there is something behind which keeps propelling the earth and the planets through space, and it may be that the same power which guides the stellar systems also guides each individual cell, and that to it the action of life in the body is also attributable. What I want to say is this, that all the definitions of life remind one of the celebrated dictum that “language was given to enable us to conceal our thoughts,” although in the language used by different philosophers I find not so much that they wish to conceal their thoughts as that they desire to conceal their ignorance. The truth is, that we have not got a step further, notwithstanding all the philosophers who have given us the results of their science and knowledge—we have not

arrived at a more satisfactory opinion yet as to what life is, or how it gets where it is found, than is obtained from the account given by the historian of creation, who tells us that man having been made, God "breathed into his nostrils the breath of life."

Captain F. PETRIE.—Before this discussion closes, I would venture to refer to Professor Lionel Beale's most valuable Address, as President for 1879-80 of the Royal Microscopical Society. In that Address he treats of the phenomena of living matter, and after a careful examination of the subject concludes thus :—

"I venture to throw the most important conclusions into the form of propositions.

"The phenomena of living matter are not due to the properties of the matter. Vital actions are of an order absolutely distinct from any known physical actions.

"Life force, or power, has not been, and cannot be, evolved in any way from matter only, nor is it a consequence of changes occurring in matter ; but, on the contrary, life influences and determines changes in the matter, which changes are quite peculiar.

"The vital phenomena of the lowest simplest forms of living matter are of the same general nature as those of the highest, and are as far removed as are the latter from any kind of physical change.

"The assertion that any low forms of life are near to, or establish any transition towards, the inorganic, is not justified by any facts known to science.

"The attempts made to make the public believe that the so-called properties of living matter belong to the same order or category as that in which known properties of known forms of non-living matter can be included, are not to be justified by an appeal to facts, and are therefore contrary to the principles of science.

"Every vital phenomenon is absolutely different in its nature from every physical (mechanical or chemical) action. There is no analogy whatever between the two sets of phenomena.

"The present state of knowledge justifies the conclusion that no form of living matter existing at present, nor any one which existed in the past, directly originated from non-living matter, or in any way derived its powers or properties from the non-living."

The meeting was then adjourned.

ADDENDUM.

The closing observations of Professor G. G. STOKES, F.R.S., in his Address as President of the British Association for the Advancement of Science, in 1872, may not be out of place here. He said :—

"What this *something*, which we call Life, may be, is a profound mystery. We know not how many links in the chain of secondary causation may yet

remain behind ; we know not how few. It would be presumptuous indeed to assume in any case that we had already reached the last link, and to charge with irreverence a fellow-worker who had attempted to push his investigations yet one step further back. On the other hand, if a thick darkness enshrouds all beyond, we have no right to assume it to be impossible that we should have reached even the last link of the chain, a stage where further progress is unattainable ; and we can only refer to the highest law at which we stopped to the fiat of an Almighty Power. To assume the contrary as a matter of necessity, is practically to remove the First Cause of All to an infinite distance from us. The boundary, however, between what is clearly known and what is veiled in impenetrable darkness is not ordinarily thus sharply defined. Between the two there lies a misty region, in which loom the ill-discerned forms of links of the chain which are yet beyond us : but the general principle is not affected thereby. Let us fearlessly trace the dependence of link on link as far as it may be given us to trace it, but let us take heed that in thus studying second causes we forget not the First Cause, nor shut our eyes to the wonderful proofs of design which, in the study of organized beings especially, meet us at every turn."

ORDINARY MEETING, APRIL 19, 1880.

H. CADMAN JONES, Esq., IN THE CHAIR.

The minutes of the last meeting were read and confirmed, and the following elections were announced :—

ASSOCIATES :—Rev. H. K. Moore, Queenstown ; F. M. Sexton, Esq., Birmingham ; Rev. G. P. Quick, Rio Janeiro.

Also the presentation of the following Works for the Library :—

“ United States Geological and Geographical Survey.”	<i>From the same.</i>
“ Proceedings of the American Geographical Society.”	4 vols. “
“ Proceedings of the American Philosophical Society.”	“
“ Report of the United States Comptroller of the Currency.”	“
“ United States Deaf and Dumb Congress at Columbus.”	“
“ Cretaceous Plants.” By Dr. Wallich.	“
“ The Threshold of Evolution.” By the same.	“
A Pamphlet.	“

The following paper was then read by the Author :—

THE RELIGION AND MYTHOLOGY OF THE ARYANS OF NORTHERN EUROPE. By R. BROWN, Esq., F.S.A.

1. *The Aryan Race in the Homeric Period.*

THERE was a time when the mighty Aryan* race, small in numbers and simple in manners, lived undivided in Western Asia ; and from this beginning sprang Vedic-Indian, Baktrian-Iranian, Slav, Greek, Latin, Teuton, and Kelt, nationalities as yet unborn. The primitive Aryans spoke one language, the Proto-Aryan tongue ; and ere they separated, although what we now know as grammar and dictionary were

* According to Prof. Max Müller the term “Aryan” is derived from *ar* or *ara*, the *ear-th*, as ploughed (vide p. 315, note on Ertha). Thus Arya is “one who ploughs.”

unknown to their mind, yet had they already firmly established both, and in their subsequent wanderings carried with them the same general linguistic peculiarities, and in a vast number of instances even the same words.* The position of Latin with respect to the Romance dialects exactly illustrates the position of Proto-Aryan with reference to the Aryan languages. As the Proto-Aryans had one language, one class of manners and customs, and one special type of idiosyncrasy, so naturally, and even necessarily, they had but one religion ; and just as the languages of Germany and of Iran are daughters of the common Aryan speech, so the religious mythologies or mythological religions of Scandinavia and of Baktria are children of the common Aryan faith. What this primeval belief was is a matter for investigation ; but that, like the language, it was but one, is a proposition which has almost passed beyond the sphere of legitimate controversy into the region of historical certainties. To a hasty glance, the difference between the religious systems of India, Iran, Greece, Rome, and Scandinavia, seems so vast as to absolutely preclude the possibility of their having sprung from a single source ; and the same remark applies equally to the languages of those countries. Yet, as no one who has investigated the languages doubts their kinship as children of a common parent, so no thorough student of the variant phases of Aryan belief will doubt their pristine unity. The comparative study of forms of belief, whether of the Aryan race or of mankind at large, has been styled somewhat infelicitously "the science of religion"; an expression which not unnaturally aroused the hostility of those who are more desirous of finding occasion of offence than of investigating abstruse questions, and who hastily concluded that it was intended to put religion on a par with chemistry or engineering, as a branch of knowledge to be acquired by a course of scientific study. It cannot, however, be too strongly insisted that the Christian religion has nothing to fear from any amount of real investigation, comparative, historical, scientific, or otherwise ; but that, on the contrary, every *fact* added to our knowledge is more or less a gain to the (general) truth. It is easy to expose the scientific and other errors of individual Christians, as, for instance, Professor Draper has cleverly done, in his popular *History of the Conflict between Religion and Science*, in which, however, he has somewhat disingenuously mainly resolved Christianity into the Latin Church and a selection of

* Vide Appendix A. On the subject of primitive Aryan unity, vide Prof. Max Müller, *Chips*, vol. ii., Essay xvi., "Comparative Mythology."

her mediæval and other dogmas. Yet, however such a work may be applauded by the unreflecting, I cannot but think an uneasy thought must have crossed the mind of the writer at the close of his labours that his book ought rather to have been called, "A History of the Conflict between the Errors of certain Religionists and Science." It seems almost impossible that a thinker could on calm reflection avoid seeing the utter failure of such an attack. Imagine, conversely, an ardent religionist, possessed of zeal without knowledge, penning an elaborate assault upon science generally, supported only by a long account of various admitted fallacies and exploded scientific theories.

2. *Modern Investigation into Aryan and Proto-Aryan Speech.*

Sassetti, an Italian scholar who was living at Goa in the year 1585, speaks in a letter of an ancient Indian language called *Sanscruta*, in which treatises on arts and sciences were written; and De Nobili, who went to India in 1606, became "the first European Sanscrit scholar." Roth, a Jesuit missionary, appears also to have been a good Sanscritist, and wrote an account of the Sanscrit alphabet about 1666, in which year he was at Rome. Throughout the last century the knowledge of the language continued to increase, at first slowly, and ultimately with considerable rapidity. Grammars and dictionaries begin to make their appearance, and Sir William Jones, Wilkins, and Lord Monboddo all ultimately perceived that Sanscrit, Greek, and Latin, were dialects of a more ancient tongue. At length, in 1808, Frederick Schlegel invented the name "Indo-Germanic" as a general designation of the great Aryan family, and laid the foundation of true scientific investigation in his work, *The Language and Wisdom of the Indians*. Then it was seen, once and for ever, that just as the Romance languages, themselves sister dialects, can be traced back to Latin as their parent and origin ; so the Sanskrit, Zend, Greek, Latin, Teutonic, and Wendic forms of speech, with all their subdivisions and variations, are themselves but dialects of the common mother-tongue spoken by the united Aryans in the hoilethic period, when the whole Aryan "earth was of one language and of one speech." This vast advance in linguistic and general knowledge has been styled "the discovery of a new world." One immediate result of it was that the Hebrew, a comparatively modern Semitic dialect, and, with the Phœnician, a twin-daughter of the Chaldeo-Assyrian, was no longer regarded as the archaic speech of mankind, or tortured in the vain effort to make it yield Greek and Latin words. Occasionally people

are still met with who derive Jove from Yahveh, but they are rule-illustrating exceptions.

From the beginning of this century Aryan linguistic science has gone steadily forwards. Bopp's great work, *A Comparative Grammar of Sanskrit, Zend, Greek, Latin, Lithuanian, Slavonic, Gothic, and German*, 1833-52, "will form for ever the safe and solid foundation of comparative philology."* Grimm's vast *Teutonic Grammar*, 1819-37, is based on the same principle; and soon numerous specialists appear, applying scientific methods to distinct portions of the one great subject. Thus the Baktrio-Iranian language† (Zend), including the Persian cuneiform inscriptions, was successfully grappled with by the great Eugène Burnouf, who has been followed by Spiegel, the late Martin Haug, Justi,‡ West, Hübschmann, Darmesteter, Hovelacque,§ Prof. De Harlez,|| and others. The names of Sanskrit scholars are legion; Prof. Max Müller, Prof. Monier Williams, and Dr. Muir being the most prominent in this country, whilst abroad may be mentioned Aufrecht, Benfey, Bergaigne, Grasemann, Kuhn, Roth, and Whitney.

Passing on to those who have made general investigations into Aryan speech, I may mention especially Schleicher,¶ who has attempted to restore the form of Proto-Aryan, in which language he has written a story.** Ficks's great work†† is divided into seven parts, which treat of the words of the mother-language (the "Ursprache,") and of words peculiar to the Indo-Iranian, European,‡‡ Slavo-Teutonic, and other linguistic unities. For the benefit of those who have not studied the question, I have given a few specimen-words in illustration of the original unity of the Aryan language,§§ and also a list of the primary roots of the Proto-Aryan ac-

* Prof. Max Müller.

† Vide *The Religion of Zoroaster considered in connection with Archaic Monotheism*. By the Writer. This Essay, hereinafter referred to as *Zoroaster*, appears in the *Journal of the Transactions of the Victoria Institute*.

‡ Handbook of the *Zend Language* (Leipzig, 1864).

§ Grammaire de la Langue Zende (Paris, 1878).

|| Manuel de la Langue de L'Avesta (Paris, 1878).

¶ Compendium der vergleichenden Grammatic der indo-germanischen Sprachen (Weimar). "Ce précieux manuel" (Chavée) has reached a fourth edition.

** Mr. J. P. Postgate has made a similar attempt on a small scale (*Academy*, June 14, 1879, p. 523). *Svars bhragati ani varunai*, etc.; "the sun blazes in heaven" (Gk. *ouranos*). So *Rāx daivām*=Rex deorum.

†† Vergleichendes Wörterbuch der indo-germanischen Sprachen, third edition (Göttingen, 1874-6).

‡‡ This unity is doubted by some scholars.

§§ Appendix A.

cording to Fick.* Curtius† has treated of the chronological development of the Proto-Aryan, which he divides into seven periods, namely, (1) Period of monosyllabic roots,—what are now called “roots,” being merely, according to many philologists, the most primitive words; (2) Period of the determinatives, *i.e.*, the suffixes added to the primary roots; (3) Primary verbal period; (4) Period of stem-formation; (5) of compounded verbal forms; (6) of case-formation; and (7) the adverbial period, adverbs and prepositions being originally nouns which became fixed in a particular case.‡ Amongst other writers on this subject may be mentioned Ascoli, Bergaigne, Delbrück, Douse,§ Lottner, Friedrich Müller, Schmidt, Steinthal, and Windisch. Thus a vast body of scientific literature, as yet very little known in England, has of late years sprung into existence; many once-difficult problems are solved, whilst many others still await solution. Evidence is being accumulated, and even intelligent errors have frequently proved of no little service. Such, in brief, is the present state of comparative Aryan philology, which is now engaged in debating, What was the primitive form of the noun-cases? Has the inflexional Aryan language previously passed through the phases or avatars of isolation|| and agglutination?¶ and in similar abstruse and important inquiries.

Lastly, the vast and most fascinating problem of the origin of language has been attempted by Geiger,** Chavée,†† and Ludwig Noiré.†† As yet, however, the sphinx cannot be said to have revealed her secret; but she has certainly indicated, although dimly, the method of discovery. §§ Several very

* Appendix B.

† *Zur Chronologie der indo-germanischen Sprachforschung*, second edition (Leipzig, 1873).

‡ *E.g.* the Greek adverb *aei*, *aiei*, is originally the dative case of a lost Greek noun, *aios*. *Vide inf.*, sec. 20.

§ *Grimm's Law: a Study* (London : Trübner, 1876).

|| The Radical or Monosyllabic stage, in which there is no distinction between a root and a word.

¶ The Terminational stage, in which two or more roots unite to form a word. In favour of such an evolution of language may be mentioned Schleicher, Max Müller, and Whitney; against,—Pott, Renan, and Sayce.

** *Ursprung der Sprache*, etc.

†† *Idéologie Lexicologique des Langues Indo-Européennes* (Paris, 1878).

†† *Max Müller and the Philosophy of Language* (London : Longmans, 1879).

§§ “There is no reason to despair of our eventually determining this problem of problems” (Rev. Prof. Sayce, *The Principles of Comparative Philology*, Preface, xviii.).

interesting and meritorious works in this direction are somewhat vitiated by the writers confining themselves too closely within the Aryan sphere, and drawing general conclusions thence, some of which could not be sustained on a wider investigation.

3. *The Rise of Mythology.*

Mythology, in its most ancient and prominent aspect, may be broadly defined as the application in human idea to natural phenomena of the mental and physical characteristics peculiar to man and other animals; e.g., the sun is a giant, archer, racehorse, or fish; the stars are the eyes in a peacock's tail; the moon and stars are a virgin queen (*S. Ursula*, i.e., "Little Shiner") and her maiden attendants.* This application, which is a necessity of thought, in its earliest form contains nothing either moral or immoral, religious or irreligious, but has nevertheless frequently been confounded by religious writers with corrupted forms of religion. That Boreas aided the Athenians against the Persian fleet, is transparent mythology; and this in a later age passes into conscious simile, becomes connected with metaphor, allegory, symbolism, and play upon words (a feature which, by no means necessarily jocose, arises from a sound having accidentally more than one meaning); and, finally, takes its place in a high civilization as (what we term) poetical imagery and expression. That Boreas (the wild "North-wind") carried off the damsel Orithyia (the "Mountain-tree") from the top of a rock, is simple enough to us; but the first error in connection with such an idea when it has become a legend, is to regard it as an actual occurrence in human history; and not even the mighty mind of Sokrates (or Plato), so much is a man the slave of his age, could escape from this. He says: "I might have a rational explanation that Orithyia was playing with Pharmacia, when a northern gust carried her over the rocks." He sees that Boreas is the wind, but regards Orithyia as a girl thus accidentally killed. This error soon produces another, far more serious. Boreas comes to be regarded as a divine or semi-divine personage having power over the wind, and he is supplicated not to injure us, but to destroy our enemies; and so we find that at the time of Sokrates there was "some sort of an altar of Boreas at the place" where the damsel was said to have been snatched

* *Vide Zoroaster*, secs. 6, 30.

away.* To take a more elaborate instance :—Zeus, the upper heaven, the ethereal blue, loves Io, the horned moon ; and thus, anthropomorphically regarded, excites the jealousy of his mythological consort Hera, the lower and gleaming heaven. She appoints the hundred-eyed Argus to watch the damsel, and Zeus sends Hermes, the wind-power in connection with the clouds, who slays Argus, *i.e.*, covers the starry eyes, which Hera afterwards puts in the tail of her bird, the peacock ; and thus Zeus can love Io unobserved. Translated into an actual occurrence amongst sentient beings, the crude, and indeed awful result is, that the highest of the gods is represented as an adulterer ; and it was because they knew no other point of view in which to regard it, that many Greek philosophers hated mythological story, and from their standpoint rightly deemed it impious. Had such a mind as that of Plato possessed our key to these enigmas, with what keen lucidity would he have illustrated them, in what thoughts of imperishable beauty would he not have clothed them ! Thus upon a simple mythology has intruded sooner or later a corrupted religion, and as a result has produced disorder and every evil work. But religion and mythology, originally distinct, have, as I observed on a former occasion, always existed contemporaneously ; Zeus, the broad, bright, ethereal heaven, is the visible and mythological counterpart of Zeus, the supreme and spiritual God.

4. Certain Primary Unities.

In our investigations into the archaic period we are supported by the unity of the human mind and of religion ; and these in turn rest upon two prior unities, the unity of God and of the Kosmos. As to the human mind, Emerson well observes, “there is one mind common to all individual men.”† The standpoints and ideas of far-off generations are not wholly strange to us ; we can put ourselves in their place, having the same nature, passions, aspirations, difficulties, living on the same planet, and observing the same natural phenomena. “The last Rear of the [human] host will read traces of the earliest Van” ;‡ yes, will *read* them, they will not be undecypherable. As to language, again, or, at all events, as to

* Vide Jowett, *The Dialogues of Plato*, ii. 105. The myth is the subject of a beautiful bronze group, discovered by Mr. C. T. Newton at Kalymnos. “Boreas is represented with buskins and large wings as a wind-god. Orithyia seems to be looking back to the world from which she is snatched away” (*Travels and Discoveries in the Levant*, i, 330).

† *Essay on History*, 1.

‡ Carlyle, *Sartor Resartus*, 163.

Aryan speech, we may say with Prof. Müller, “We can understand the necessary breaking-up of one language into many; and we perceive that no amount of variety in the material or the formal elements of speech is incompatible with the admission of one common source. The science of language thus leads us up to that highest summit from whence we see into the very dawn of man’s life on earth, and where the words which we have heard so often from the days of our childhood, —‘And the whole earth was of one language and of one speech,’—assume a meaning more natural, more intelligible, more convincing, than they ever had before.”* As to religion, there is and has been but one true and divine religion; at sundry times and in divers manners has God in time past spoken unto the fathers of the human race, but one and the same expanding scheme and purpose was culminated by the advent of His Son. Nor is this religion founded upon sacred books only, for it existed ages ere Genesis was penned; and the beliefs of those who have wandered from it, like the dialects of their speech, are but altered copies of a single original, changed by time, locality, climate, progress, discovery, conquest, but above all by the influence of the baser side of humanity. But mark the vast importance of this fact. Just as the investigations of comparative philology bid fair in time to reproduce to our view the hidden source of language and its primeval phases, so comparative investigation into the variant religious beliefs of mankind promises to reproduce to us a primitive religion, and in so doing will undoubtedly contribute a weighty argument in favour of the truth of Christianity. People may discuss for ever such a question as, Who wrote the Book of Genesis, and when? without being able to convince each other; but it would not be easy to disregard a wide argument based upon nature and confirmed by universal history. Let no one, therefore, disparage the importance of such inquiries, or think that old-fashioned dogmatising *about* the two Testaments is all that need now be done for the defence of religion. Prof. Müller speaks of “those who are for ever attacking the Bible with arrows that cannot reach it,” and of “those who defend it with weapons they know not how to wield.” Let us shun the second class even as we would the first.

5. The Argument from General Consent.

From mention of the foregoing unities we pass naturally to a brief consideration of the argument in favour of the existence

* *Lectures on the Science of Language*, i. 447–8.

of God and of the truth of religion which is derived "from the general consent of mankind"; and as Stuart Mill supposed that he had "disposed briefly"^{*} of it, I will here notice his disposition. It has, we learn, "little scientific weight, but greater influence than much better arguments." Why? *Ans.* Because it appeals to "authority," by which the opinions of the majority are governed. But if we are to be governed at all, what should govern us save authority?[†] No answer given. "Thinkers" do not value it; to them what Plato and Newton thought is unimportant, they can cogitate for themselves. "The argument from other people's opinions has little weight." A question respecting the archaic religion of China, the management of an ironclad, the reform of a university, arises. The experts appear before us; we hear what they say, and smilingly dismiss them, remarking, "That you have profoundly studied the subject and are agreed in your views of it does not affect us; the argument from your opinions has little weight." As a matter of fact, all the world knows that the argument from other people's opinions, *e.g.*, the conclusions of the judges of the land or of eminent physicians has the greatest weight; and rightly so, if it is possible for one man to know more of a subject than another. The opinions of others, he continues, should make us weigh their reasons. Doubtless. "Accordingly, those who make any claim to philosophic treatment of the subject, employ this general consent chiefly as evidence that there is in the mind of man an intuitive perception, or an instinctive sense, of Deity." Certainly. "From the generality of the belief, they infer that it is inherent in our constitution; from which they draw the conclusion that the belief must be true." The conclusion drawn is not that the belief *must* be true, as if proved to demonstration like a mathematical problem, but that it thus comes before us with a vastly preponderating weight of probability in its favour—95 points out of the 100; and this conclusion is thus no mere vague possibility, as, *e.g.*, that the belief *may* be true, which would afford no assistance. But the argument from consent is said to "beg the question." How so? Simply "since it has itself nothing to rest upon but the belief that the human mind was made by a God, who would not deceive His creatures." In other words, the argument assumes that the conclusions of the mind are to

* Vide J. S. Mill, *Theism*, 155, *et seq.*

† "Kent. You have that in your countenance which I would fain call master.

Lear. What's that?

Kent. Authority."—*King Lear*, act i., scene 4.

be relied upon, and this is called "begging the question"! Now the mind is either capable of coming to a true conclusion respecting Theism or any other subject or it is not. If it is not, farewell to Mill's elaborate reasonings on the matter; they are intrinsically worthless. Thus Samson perishes with the Philistines against whom he fights. All conclusions are founded on the assumption that we are capable of drawing them. But is this a *mere* assumption? Are all our mental efforts thus valueless? Certainly not. And why? Because we have in numberless instances found our theories to be absolutely correct, i.e., to be thoroughly supported by and in perfect harmony with objective actuality. The mind has a theory respecting thirst (it matters not for the present purpose whether it be intuitive or acquired), and comes to a true conclusion on the subject. Therefore, we need not beg the question by assuming that the mind *can* come to a true conclusion, because we know as a fact that it does so arrive. It is of opinion that thirst can be quenched by certain liquids, and this is the case. The mind, therefore, comes before us not even merely as a credible witness, but as a witness whose truthfulness and credit have been proved a score of times, and whose evidence must therefore be received with the greatest respect. Such a witness may, it is possible, deceive either wittingly or unwittingly; but its testimony appears with a vastly preponderating weight of probability in its favour—95 points out of the 100. Thus Mill's argument, if valid, would destroy all reasoning, including of course his own; would even, "force entangling itself with strength,"* destroy itself; for, if the mind *can* come to no sound conclusion, then the proposition that *The mind can come to no sound conclusion* is untenable. Thus the argument from general consent emerges from this attack not merely uninjured, but strengthened, so far as our belief in it is concerned, by being able to resist such an assailant.

Mill having, as he supposes, routed the argument, would fain pursue the flying foe, and asks, "What ground does the general prevalence of the belief in the Deity afford us for inferring that this belief is native to the human mind, and *independent of evidence?*" These last words convert the idea contained in the question into a truism. No one supposes that general beliefs are "*independent of evidence*"; but evidence arises from circumstances internal or subjective as well as from circumstances external or objective. If we omit the words italicised we may answer the question by another —

* *Antony and Cleopatra*, act iv., scene 12.

What ground does the general fondness of dogs for a bone afford us for inferring that this fondness is innate in the dog? Or, again, How does a characteristic propensity assist in determining character? which is an absurd inquiry. Again, Mill seems strangely enough to think "that the appearances in nature of a contriving Intelligence," which form a portion of objective evidence, interfere in some mysterious way with man's innate ideas on the matter, though how does not appear; the simple fact being that the intuitions of the mind are harmoniously answered, and thereby confirmed by external actuality. Passing on to consider the almost universal belief in Deity "among barbarous tribes," and having put forward the very doubtful proposition that "the ignorant in civilized countries take their opinions from the educated," he very briefly constructs the imaginary history of the past necessarily adopted by Evolutionists, according to which mankind started with a stock in trade "of primitive ignorance" and "Fetichism of the grossest kind," which poor materials, by some stupendous miracle, have yielded the present state of things.

Having thus *assumed* that the savage has no innate belief in Deity, he adroitly presents "the Intuitionist" with a dilemma, the whole force of which however is solely founded upon the previous assumption. He puts the argument thus:— Some men believe in a Deity, but others (primitive savages) do not, and therefore there is no "general consent" in the case; so that "it is needless to dwell upon the difficulty of the hypothesis of a natural belief not common to all human beings, an instinct not universal." It is quite needless, for the facts of the case present no such contradiction, raise no such dilemma. The Turanian (to use a term now familiar, but yet much objected to, and perhaps abused by some writers), as well as the Aryan or the Semite, worshipped God; and, not liking to retain Him in his mind, fell into idolatry or the worship of the visible. The divine King became Molekh, the Heavenly Father a degenerate Jupiter; but Molekh and Jupiter, like dark and lurid clouds, merely for a time and in a measure shrouded the one only and eternal Heaven.

We may consider with advantage Mr. Herbert Spencer's reasonings in the opening chapter of his *First Principles* in support of the proposition that belief "gains in strength according to the number of its adherents." In fine, the force and importance of the argument from general consent can hardly be over-estimated, especially when considered in connection with the actual result of investigation into archaic religious opinion.

6. The Wends, their several Divisions and Religious Belief.

The foregoing considerations respecting the nature and province of mythology, the unity of the human mind, of religion, and of the Aryan race and its language, and the value to be placed upon the argument from General Consent, would not be strictly appropriate in a solely separate investigation into the special phases of the religion and mythology of the Aryans of Northern Europe. But as I am dealing with the subject from a comparative point of view, which indeed is its far most interesting and important aspect, it is absolutely necessary that these preliminary principles should be carefully borne in mind; and it is also desirable that the paper should be considered in connection with my former one on *The Religion of Zoroaster*.* There, after a consideration of the Eastern Aryans, i.e., the Iranians and Vedic Indians, certain definite conclusions were arrived at; and if those deductions be correct, a study of the north-western branch of the same great family must, in accordance with the principle of unity, furnish similar results. Should such be the case, it is obvious how greatly the prior argument and method of investigation is strengthened and confirmed.

The Wends† and the Teutons form the two great divisions of the Aryans of Northern Europe, and the former are divided into the Letts and the Slavs. The Letts consist of the Lithuanians and the inhabitants of Kurland and Livonia. Lithuanian is the language of a small portion of the inhabitants of East Prussia and of those of the adjoining part of Russia, and is akin to the old Prussian, which latter dialect became extinct in the seventeenth century. At the present time it employs some forms more closely resembling those of Sanskrit than the corresponding modes of expression in Greek and Latin;‡ and is "more conservative in its retention of many primitive grammatical forms than even Sanskrit"§ itself. The Slavs divide into three branches—Eastern, the Russians; Western, the Poles, Bohemians, and Moravians; and Southern, the Serians, Bulgarians, Croats, etc. Of old non-Christian literature Wendic has none; no writer of an *Edda* or a *Veda*, no Homer or Hesiod arose among them to compose theogonies and describe the relative positions and the proper epithets of the

* Vide sec. 2.

† "Winidae being one of the most ancient and comprehensive names by which these tribes were known to the early historians of Europe" (Prof. Max Müller. *Lectures on the Science of Language*, i. 226).

‡ *Ibid.*, 227.

§ Rev. A. H. Sayce, *Principles of Comparative Philology*, 47.

gods. Nor do these matters seem to have been much investigated by any contemporaneous foreign writer; so that almost all which survives consists of a few names of divinities and a vast mass of folk-lore, which on analysis is found to harmonize with that of other branches of the Aryan family, but does not concern our present purpose.* Beginning with the general name for "god," we find that amongst the Letts it is *dewas*; old Prussian, *deiwas*; Lithuanian, *diewas*; old Irish, *dia*; Latin, *deus*; Greek, *theos*; Sanskrit, *deva*, "the Bright-one," Dyaus-Zeus;† and as we know the concept and character of Zeus-Jupiter, "the supreme Aryan god," we see by the faithful testimony of language that the Letts, like the other archaic Aryans,‡ worshipped a great heaven-father, of whom the bright blue sky was the material symbol. Among the Slavs the common name for "god" is *Bogu*, which, as we have seen,§ is the Vedic *Bhaga*, "the Distributer," a phase of the Supreme as *Isodaites*, "the Equal-divider," who gives to all their portions in due season. In the *Avesta* *Bagha* is used in the general sense of "god," and the Slavonic religion "knew a *biel-bog*, or white god, and a *czerny bog*, or black god,"|| two personages corresponding to the Iranian *Ahura-mazda* and *Angromainyush*. It is to be observed that in some instances, both of language and belief, there is a special connection between the Iranians and the Wends, which, amongst other reasons, may be accounted for by original geographical proximity. *Czerny-bog* appears further west as the Anglo-Saxon malevolent divinity, *Zernebok*,¶ the nocturnal potency which appears at times in a semi-humorous aspect, as in the tricksy *Fuck*; whence, next, the name *Pug*, applied first to a monkey from its tricks and playfulness, and afterwards to the now-familiar Dutch breed of dog, as having a monkey-like face. To such strange uses do august and sacred terms often descend! We know from the previous investigation that *Bogu*, the distributing god, is *Dewas*, the Bright-one; and that Lett and Slav have thus, like Indian and Greek, selected different names to express the same great Being.

* Mr. W. R. S. Ralston, author of *The Songs of the Russian People, Russian Folk-Tales*, etc., has made this field especially his own.

† Vide *Zoroaster*, sec. 12.

‡ "Fick agrees with Pictet (*Les Origines Indo-Européennes*) in discovering indications of monotheistic thought in the midst of the naturalism of the primitive Aryan people" (Pezzi, *Aryan Philology*, 178).

§ *Zoroaster*, sec. 19. || Haug, *Essays on the Parsees*, 273.

¶ Cf. Scott, *Ivanhoe*, cap. xvi, "Mista, Skogula, and Zernebock, gods of the ancient Saxons."

Another name for the god of the sky is Svarogu,* the "Gleaming Strong One," and Svantovich,† the "Wise and Holy." The bright heaven-god is manifested in, and sometimes in idea glides almost imperceptibly into, the bright god of the heaven, i.e., the sun-god, whose material counterpart is the solar photosphere.‡ And so the Byel-bog, or "White-god," Svantovich, seems to have become a sun-god; and Montfaucon§ gives a symbolical representation of him as a four-headed|| human figure standing on a pedestal and holding a bow, often a symbol of the solar god. The sun-god is also called Dazhbog,¶ the "God of Heat;" and he is naturally represented as the son of Svarogu, the sky-god. We find an impersonation of fire, Ogon, the Vedic Agni,** and may judge to a considerable extent of the character of the former from that of the latter. Perkunas, the rain and thunder-god, has been compared with the Vedic Parjanya, the "rain" and raining-giving power, the son of Dyaus. Below the god of heaven and the sun-god, the Varuna and Mitra†† of the Wends, stand various other personages, who represent phases of the sun-god, the under world personified, etc.; but very little detail about them has survived, and especially the meanings of their names (the best clue to an archaic concept) are either unknown or doubtful. Tiele well remarks,—"Religion among the Wends remained at a point of development far behind that of the Vedic and old German religions. It is certainly lower than any of the Indo-Germanic religions with which we are

* Cf. Sk. *svar*, the sun, heaven; *svarga*, the sky, i.e., "the gleaming," in Greek mythology Hērē, wife of Zeus, the upper aether. *Og*=Sk. root *oij*, whence *oxas*, strength, splendour, etc. Cf. old Irish *og*, young, fresh; *oig*, a champion; Gk. *hyg-īs*.

† Cf. Iranian *spenta*, "holy," and *vid*, *videre*, *eidd*, "to know."

‡ The all-important distinction between Sun-god and sun is admirably illustrated by a reply of the Santhals, a very low race in India, who, when told that it was absurd to say that Chando (i.e., "the bright one"), the sun, had created the world, replied, "We do not mean the visible Chando, but an invisible one" (apud Prof. M. Müller, *Lectures on the Origin of Religion*, 208).

§ *L'Antiquité Expliquée*, vol. ii., part ii., plate clxxxiv. The figure is taken from a work on ancient German divinities by Grosser, published at Leipzig in 1714.

|| For a consideration of four-faced solar divinities, which represent the sun in the four seasons, e.g., the Baal-image set up by Manasseh in the Temple, vide *The Great Dionysiac Myth*, i. 359, *et seq.*

¶ From the root *dah*, *dagh*, "to burn." Cf. Zend, *dash*, "to burn"; Goth. *dag-s*, Ang.-Sax. *daeg*, Eng. *day*, i.e., the time when the burning (sun) is visible.

** Vide *Zoroaster*, secs. 30-32. †† Vide *Ibid.* secs. 15, 16, 26, etc.

acquainted.”* But it has had no great chronicler, cosmogonist, or poet, and this is perhaps its misfortune almost as much as its fault. We can see from the fragments that the general outline of the intellectual building was similar to that of the Teutons and the Eastern Aryans, but inferior as a Welsh cathedral is to Lincoln or York.

7. *The Teutons and their several Divisions.—German Religious Belief.*

The Teutons, with whose religion and mythology, as reflected in the Scandinavian branch of the family, we are now more particularly concerned, may be linguistically divided into the High-German, Low-German, and Scandinavian branches. High-German, or the general dialect of Germany, divides itself into (1) Old High-German, *i.e.*, the language prior to the twelfth century; (2) Middle High-German, the language from the twelfth century to the Reformation; and (3) New High-German, the language since the Reformation. Low-German produced the extinct dialects of Gothic, Anglo-Saxon, Old Saxon and Old Dutch, and their living successors; and from the Old Norse of the Scandinavian branch spring the dialects of Denmark, Sweden, and Norway. The German religion “does not essentially differ”† from that of the Northmen or Scandinavians, which fortunately has been preserved in full as a specimen of the intellectual development of the whole family; and it is in the Norse religion that the Teutonic faith must mainly be studied. Some of the scanty statements of classical authors, however, on the subject are, notwithstanding their late date and the very limited knowledge of the writers, of considerable value in an archaic investigation, particularly when viewed in connection with linguistic science. Julius Cæsar, who was but a short time in Germany, says that the Germans worshipped the gods whom they saw—the Sun, Vulcan (*i.e.* the igneous principle, Agni-Ogon), and the Moon.‡ Tacitus, who had more carefully studied the matter, describes them as worshipping Mercury, Mars, and Ertha§ (“*id est, Terram matrem*”), and states also that some of the Suevi revered Isis.|| The first German

* Tiele, *Outlines of the History of the Ancient Religions*, 180.

† *Ibid.* 189.

‡ *De Bello Gallico*, vi. 21. He adds,—“*Reliquos ne fama quidem acceperunt.*”

§ Root, *ir, ri*; later form, *ar*; Sk. *ira, ida*, Gk. *era*, Old High-Germ. *ero*, Gaelic *ire*, Gothic *airtha*, Ang.-Sax. *eortha*, *i.e.*, land which is *cared* (cf. Auth. Ver. Isaiah xxx. 24) or made *ar-able*. || *Germania*, ix. xl.

divinity here referred to is Wuotan,* whose identification with the Latin Mercurius, a personage absolutely but most incorrectly identified with the Greek Hermes, is very interesting, inasmuch as both Odhinn and Hermes are wind-gods, and the *petasos* (broad-brimmed hat) and *talaria* (ankle-wings) of the latter appear in the mantle and eight-legged horse, Sleipnir, the "Slippery," of the former. By Mars is meant either Tyr or Donar (Thorr) probably the former. The latter seems to be the personage whom Tacitus calls Hercules. Hertha is Demeter ("Mother Earth"), i.e., the cultivated and orderly earth; and her German ritual corresponds with the Iranian view of agriculture as a sacred duty.† Isis is not the great Egyptian goddess, but Ziza, an earth-mother and female reflection of Zio, and of whom we know but little more than her name, and that her symbol was a boat-shaped vessel.‡ The unfortunate habit, common to classical writers, of applying the names of their own divinities to those of foreign nations, has been a source of great confusion, from which, however, we have fortunately now emerged. Tacitus adds this remarkable testimony respecting the religious feeling of the ancient Germans,—“Moreover, neither do they think to enclose the gods in walls, nor to portray them in any kind of human form, on account of the greatness of heavenly beings. Woods and groves they consecrate, and call by the names of gods that mystery (*secretum*) which they behold by religious awe alone.” Thus did our ancestors, even at a late period, understand that the Most High dwells not in temples made with hands; and whilst a hasty observer (like those superficial travellers who tell us they encounter races without any religion) described them as worshipping the Visible alone, it is evident that the exact opposite of his statement is correct, and that they worshipped the Invisible alone, regarding the Visible as its creature and manifestation. Lucanus§ mentions two German divinities whom he calls Teutates and Hesus. The name of the former, the Keltic Taith, is connected with the general name of the great Aryan divinity, the German Tiu or Tiw, old High-German, Zio; Oscan, Djovis; old Latin, Vedjovis (Jupiter, Zeus, Dyaus); the Norse, Tyr.|| Hesus or Esus,

* Old High-Germ. Wuotan, New High-Germ. Wodan, Ang.-Sax. Woden; vide *inf. sec. 9*, *Odhinn*.

† Vide *Zoroaster*, sec. 8. The car of Hertha was cow-drawn.

‡ She is probably the Siwa of Grosser, who gives a picture of her resembling a Venus with long, flowing locks. § *Pharsalia*, i. 444.

|| As to Tyr, vide *inf. sec. 9*. Camden observes, “Our Britons call God Dyw” (vide *Zoroaster*, sec. 12).

a statue of whom has been found at Paris, and after whom Hessary Tor in Devonshire is thought to be named, is, if possible, a still more interesting epithet, for it carries us back to the other grand Aryan name of God, Asura, the "Living," a noble title which I have elsewhere considered.* Thus, in the far Aryan west, as in the far Aryan east, we find the Deity called by the same great names; the Asura and Dyaus of India reappear in the Esus and Taith of the Kelts, and the value of linguistic testimony in favour of the monotheistic position can hardly be over-estimated. It is only those unfamiliar with the question who will regard such inquiries as merely laborious trifling, which, whilst it may amuse the otherwise idle hours of an antiquary, is unworthy of the serious attention of the defender of the Faith.

Tacitus also states that the Germans celebrate in ancient songs the god Tuisco and his son Mannus, the founder of their race.† Tuisco or Tivisco, i.e., "the Tiu-ish," is a variant form of Tiw; and, similarly, amongst the Aryan Indians Manu,‡ i.e., Man, is styled the son of Dyaus, in other words, —'Αδάμ τον Θεοῦ. "Why was Tuisco called the father of Mannu? Simply because it was one of the first articles in the primitive faith of mankind that in one sense or other they had a father in heaven."§ Thus we find the Germans worshipping the great Heaven-father, known to and believed in by the undivided Aryan race, and beholding Him by faith and reverence alone. Man, as created by God out of the dust, has ever known that he is the son both of Zeus and of Gaia, of Tuisco and of Hertha, of Dyaus and of Prithivi.||

8. Scandinavian Sacred Literature.

Iceland produced and preserved Scandinavian sacred literature, which consists of the Elder and the Younger *Eddas*. The word *Edda*, meaning "great-grandmother," is used in this connection in the special sense of guardian of the ancient lore, and as a name is not anterior to the fourteenth century. The most complete codex of the Elder *Edda* was found in 1643 by the learned Bishop Brynjolf Sveinsson, and was ascribed by him to Saemundar, son of Sigfus, commonly called "the

* Vide *Zoroaster*, sec. 11, "History of the name Asura"; vide *inf.* sec. 9. The Aesir. From the root *as*, "to breathe" (vide Appendix A.).

† *Germania*, ii.

‡ From the root *man*, "to think." Man is "the Thinker"; cf. Min-erva, Min-os, *mens*, *mens*, *mind*, etc.

§ Prof. Max Müller, *Lectures on the Science of Language*, ii. 501.

|| The "Broad" Earth; cf. Gk. *platōs*.

Wise," who was born at Oddi in the south of Iceland about A.D. 1055, and died in 1133. Bishop Sveinsson entitled his transcript of the codex, *Edda Saemundi Multiscii*, and the original is now in the royal library at Copenhagen. The compilation of the Younger *Edda* is ascribed to Snorri, son of Sturla, who died in the year 1241, and it is called *Edda Snorra Sturlusonar*. The Norsemen began to colonize Iceland about A.D. 860, and Christianity became the religion of the country in the year 1000. "The men to whom the collection of the ancient Pagan poetry of Iceland is commonly ascribed were men of Christian learning. It is owing to their labours that we know anything of the ancient religion . . . of the Norsemen. The religious system of Iceland is the same, at least in its general outline, as that believed in by all the members of the Teutonic family, and may truly be called one of the various dialects of the primitive religious and mythological language of the Aryan race."*

The collection of songs which compose the Elder *Edda* may be divided into the lays (1) of the gods, and (2) of the heroes. Amongst the former the most remarkable is the *Voluspa*, i.e., "The Vala's† Prophecy," which treats of the creation, the birth of giants, gods, and men, the contest which at the end of the present state of things shall occur between the powers of good and evil, and the destruction and renewal of the world. *Baldur's Dreams*, *The High One's Lay*,‡ and *Odhinn's Runesong*, are the titles of some of the other songs of the gods.

The Younger *Edda*, which is in prose, consists of three parts: (1) *The Vision of Gylfi*, an ancient king of Sweden who was desirous of knowing particulars concerning the gods, and of the destiny of the world; (2) *The Sayings of Bragi*, the god of eloquence; and (3) the *Skalda*, a history of the origin and character of the poetic art. In the *Vision of Gylfi* is given an account of the creation of the world, of the various principal divinities, powers of evil, and monsters; of the great contest to take place at the end of the present age, and of the new heaven and earth. Thus in the Eddaic compilations, themselves formed within a comparatively short period after the

* Prof. Max Müller, *Chips*, ii.

† "The most remarkable class of seid-women [Seid was a species of divination, possibly connected with boiling] were the so-called Valas or Völvas. We find them present at the birth of children, where they seem to represent the Norns" (Thorpe, *Northern Mythology*, i. 214), the Teutonic Parcae. *Vala* may mean "one possessed of hidden knowledge" (cf. Sk. root *val*, "to cover"). Mr. Stallybrass well compares "the Slavic *volkhv*, *magus*," with *völva* (Grimm's *Teutonic Mythology*, i. 97. Eng. Trans.).

‡ The *Hamavat* or High Song of Odhinn.

formal establishment of Christianity in the country, are preserved religious and other ideas of a most remote antiquity, and which belonged in their origin to the archaic period of the undivided Aryans.

9. *The Norse Divinities.*

In accordance with the principle adopted on a former occasion,* I will next tabulate the Norse divinities, and notice the meaning of their names. The following are the principal personifications or divine personages of the Eddaic faith :†—

Baldr. “The White-shiner”; Anglo-Sax., *Baldag*; the Slavonic *Byel-bog*. The bright summer and day-god, father of *Forseti*, “First-sitter,” the god of justice, which here as elsewhere is connected with the sun. Son of *Odhinn* and *Frigga*, and husband of *Nanna*, the flower-goddess, who (like *Istar* and *Persephone*) descended with him to the Under-world; he was accidentally slain by *Hodhr*.

Bragi. “The Brilliant.” The god of poetry and eloquence, son of *Odhinn*, and husband of *Iduna*. Cf. Eng., *brag*.

Freyia. “The Lady.” Goddess of love, and sister (female-reflection) of *Freyr*; mistress of Friday, *dies Veneris*. A variant phase of *Frigga*.

Freyr. “The Lord.” Cf. Gk., *Kurios*. A beneficent sun-god, presiding over rain, sunshine, the earth-fruits, and wealth; is united with *Gerdha*, the earth-girding sea.

Frigga. “The Fruitful.” Cf. Lat., *frugis*. Wife of *Odhinn*, and queen of the gods; the fruitful, cultivated earth.

Heimdallr. “Enlightener-of-the-worlds” (Bunsen). An ancient sun-god and light-giver, dwelling in *Himinbiorg*, “*Mons Ccelius*,” riding the steed *Gulltopp*, “Gold-man,” lord of the rainbow-bridge, *Bif-rost*, “the trembling road,” sentinel of heaven and possessor of the *Gjallarhorn*, “the blast-horn,” i.e., thunder, the sound of which echoes through space, whilst its point sticks in *Nifheimr*, “Nephale-home,” the ninth and lowest world. He hears and sees all things, and in his exalted character closely corresponds with the Vedic *Agni*.

Hermodhr, “Courage-of-hosts.” The messenger of the gods,

* Vide *Zoroaster*, sec. 19.

† Vide Jacob Grimm, *Teutonic Mythology* (vol. i., translated by Jas. S. Stallybrass, 1880); Simrock, *Handbuch der Deutschen Mythologie*; Thorpe, *Northern Mythology*; Bunsen, *God in History*, vol. ii.; Sir G. W. Cox, *Mythology of the Aryan Nations*; Anderson, *Norse Mythology*; Tiele, *Outlines of the History of Religion*, cap. iv., sec. 5.

Sol Victor, the Yule (*i.e.*, *hjul*, "wheel") sun of December 25, the returning and brightening sun. Descended to the Under-world to fetch Baldr from the realms of the dead.

Hodhr. The name, according to Thorpe, signifies "war or battle," but this is very doubtful. "It may be traced in the forms Hadupracht, Hadufians, etc., to the Chatumerus of Tacitus."* The blind god, lord of darkness, who, accidentally and at the instigation of the evil Loki, slays Baldr, his twin-brother (*i.e.*, the powers of day and night are twins), and is slain in turn by his brother Vali when the latter is only one night old (*i.e.*, by the sun of the next day).

Hoenr. "The Winged." The air-spirit, one of the creating triad.

Iduna. "The Fair-one." From the root *id*, 'again,' expressive of activity and renovation. Cf. the Vedic Ida, the cultivated earth. Guardian of the golden apples of ever-youth.

Odhinn. "The Pervader." Old High-German, Wuotan; New High-German, Wodan; Frisian, Weda; Sax. Wuodan, Woden. From *vadha*, 'to go;' pret. *vodh* or *odh*.† Cf. Latin, *vadere*; Sanskrit root, *vā*, "to blow"; *vata*, "air," and hence the air-god; Greek *aō*, *aér*, etc. The divine protagonist, king and father of the gods, the æther-wind-spirit of the world. Called Alfadir, "Father-of-all"; Thrida, "the Third"; Har, "the High"; Gangleri, "the Ganger" or quick-goer; Yggr, "Deep-thinker"; Valfadir, "Sire-of-the-slain," and has about two hundred other epithets. One of the creating triad, and lord of Wednesday. Sometimes united with and sometimes distinguished from a still higher and more august All-Father; turned by Christianity into a demon, and becomes the Wild-huntsman, etc.

Oegir. "The Dread." Cf. Ogen, Ogyges, Ogre. God of the stormy sea, whose name is still given to the tidal wave on some English rivers, *e.g.*, the Ouse and Trent.‡ His wife is Ran, "the Robber," the hungry sea.

Thorr. "The Extended."§ Old High-German, Donar;

* *Mythology of the Aryan Nations*, ii. 93.

† Vide C. W. Keary, *Wind Myths* (in *The Contemporary Review*, July, 1875, p. 282).

‡ "Lo! along the river's bed a mighty eygrie reared his crest" (Miss Ingelow, *The High Tide on the Coast of Lincolnshire*).

§ "The word in its first meaning has no reference to noise. The root denotes simply extension as applied, whether to sound or to any other objects, and from it we have the Greek and Latin words *reīw* and *tendo*, to stretch, *rōvoc*, tone, *i.e.*, the stretching and vibration of chords" (*Mythology of the Aryan Nations*, i. 378).

Taranis (Lucan). God-power throughout the kosmos. The mighty, striding lord of the bright heaven, of thunder, lightning, and rain, champion of the gods, and unwearied defender of gods and men, heaven and earth against the powers of evil. Called Veorr, "the Defender," and Asa-bragr, "the Asa-prince"; father of Magni, "Might," and Modi, "Courage"; lord of Thursday.

Tyr, Ty. "The Bright!" Cf. Tiu, Zeus, etc. Son of Odhinn, god of war and lord of Tuesday.

Vali. "The Vigorous." Called Bui, "tiller of the earth;" a mighty archer, the strong sun of morning and of spring who avenges his brother Baldr's death upon Hodhr.

Ve. "The Sacred-one."^{*} Brother of Odhinn and Vili; this triad ruled heaven and earth, which, with the sea, they formed from the body and blood of the giant-monster Ymir, "the Roarer," the primeval chaotic abyss.

Vidhr. "The Forest-god." From *vidr*, "a wood." Son of Odhinn, and called the Silent; an impersonation of the eternal might of God in nature.

Vili. "Will," i.e., the power which sets things in motion. Cf. Sk. root *vel*, "to move about," Greek *eilō*, Latin *volvo*, etc. One of the creating triad.

The divinities generally are sometimes called *tivar*, "gods," Vedic, *deva*,[†] and Aesir (sing. *As*, Goth, and Old High-German *Ans*; Sk. root *as*, 'to be, live, exist,' Eng. *is*. The primary meaning is 'to breathe.' Cf. *Asura*, *Hesus*, etc.)[‡] "the Living-ones." A certain section of the divinities was called the Vanir,[§] and ruled in air and sea. Freyr and Freyia were, according to the late systematizing, Vanir; but were taken into the number of the Aesir or ethereal gods. The sun (solar-photosphere) is personified as Sol, the sister of Mani, the moon.

10. *Analysis of the Norse Divinities.*

The foregoing eighteen personages on analysis appear as follows:—

* "Ve signifies in the O. Nor. tongue, *a place of assembly*, with the idea of holiness and peace. Goth. *veihs*, O. H. G. *wih*, sacred" (Thorpe, *Northern Mythology*, i. 146).

[†] Vide *Zoroaster*, sec. 12.

[‡] Vide *Ibid.* sec. 11. "History of the Name *Asura*."

[§] "The word 'wanen' was originally 'anen,' coming from the root *and*, i.e., 'breath,' 'air,' 'spirit' (Bunsen, *God in History*, ii. 486).

I. *Phenomenal Objects.* II. *Abstractions of Deity.*

1. <i>Aërial.</i>	
Hoenr.	Ve.
Odhinn.	Vidhr.
2. <i>Semi-solar.</i>	Vili.
Bragi.	
Heimdallr.	
Thorr.	
Tyr.	
3. <i>Purely solar.</i>	
Baldr.	
Freyr.	
Hermodhr.	
Vali.	
4. <i>The Earth.</i>	
Freyia.	
Frigga.	
Iduna.	
5. <i>The Sea.</i>	
Oegir.	
6. <i>Darkness.</i>	
Hodhr.	

NOTE.—Odhinn is also a semi-solar and kosmogonical divinity, and a representation of the Supreme.

General character of the personages—supporters of existing kosmic order.

The personifications representing Earth, Sea, and Darkness, explain themselves; and, like the Vedic Prithivi,* may be dismissed from the number of original divinities. As before observed,† there must have been a time when the one sun had not yet been divided in idea, and therefore the purely solar divinities necessarily resolve themselves into a sun-god. The diurnal sun (Baldr) becomes the sun of the Under-world (Hermodhr); and, subsequently, the sun of the next day or next year (Vali). There is also the mighty power of the bright heaven, but after all, the Bright - brilliant - extended - enlightener-of-the-worlds (Tyr-Bragi-Thorr-Heimdallr) is but the sun-power on high who rules with thunder and lightning. The solar photosphere, as noticed, was distinct from all these personages, and spoken of as female; so we have, in effect, a male Sun-and-heaven-god, in connection with whom is an All-Father, Odhinn, who with two mysterious companions, Ve and Vili, formed heaven and earth in kosmic order. But Ve and Vili are only abstractions, the combination of their names signifying that the Will-of-the-Sacred-one, i.e., of Odhinn, was so exercised upon the kosmos. And, similarly, the first man and woman were animated by Odhinn and two other

* Vide Zoroaster, sec. 20.

† Ibid., sec. 23.

mysterious companions, Hoenr and Lodr. The meaning of the name Hoenr is obscure, but Lodr undoubtedly signifies "warmth," and the myth appears to express that the corporeal frame of man was in the first instance animated by Æther (spirit), Air (soul), and Fire (physical life-heat). Lastly, the renovating might of deity (Vidhr) will be exercised on the renewed earth (Iduna); and Vidhr is only a son (phase) and even a name of Odhinn.* Baldr, Bragi, Heimdallr, Hermodhr, Thorr, Tyr, and Vali are also all sons (manifestations) of Odhinn. Again, none of these names except the general appellation As (plural Aesir), Tyr, and perhaps Iduna and Oegir,† are primitive (Proto-Aryan). In the period of considerably more than two thousand years which elapsed between the departure of the Teutons from the primitive Aryan home and the discovery of the Norse divinities in Iceland, some old names have doubtless faded away, these and other numerous new ones have arisen, but through all these ages the great name of God, Asura-Zeus, As, or Asa-Tyr, has remained unconquerable by time. It is true that Tyr in the Norse Pantheon as formerly constituted does not occupy as high a place as the Vedic Dyaus-Varuna, Zeus, Ju-piter, or the German Tiu; but he was originally identified with Odhinn,‡ although afterwards he became distinct in idea, and was relegated to a lower, yet very honourable position, in the same way that Dyaus, and subsequently Varuna, were superseded in India by other divinities. Thus, on analysis, these personages resolve themselves into a spiritual All-Father in heaven, whose greatness and goodness are chiefly manifested in solar light; that is to say, we meet again with Varuna and Mitra under other names.§ Kingsley, in a beautiful passage, thus sets forth the faith of our ancestors:—"They looked round upon the earth, those simple-hearted forefathers of ours, and said, 'Where is the All-Father? Not in this earth; for it will perish. Nor in the sun, moon, or stars; for they will perish too. Where is He who abideth for ever?' Then they lifted up their eyes and saw, beyond all which changes and will change, the clear blue sky, the boundless firmament of heaven. The All-Father must be there, unchangeable in the unchanging heaven; bright, and pure, and boundless, like the heavens; and like the heavens, too, silent and far off. So they named him after the

* *Hrafnagaldr Odins* ("Odhinn's Raven's Song"), 17.

† Perhaps connected with the Sk. root *oj* (vide p. 314, note).

‡ "Originally Odin, like Zeus, was the Æther. As such he bore the name of *Tzin*, in the northern dialect *Tyr*, both of which are forms of *Zeus*, *Dev*, *Divus*, *Deus*" (Bunsen, *God in History*, ii. 488).

§ Vide *Zoroaster*, secs. 24-26.

heaven, Tuisco—the god who lives in the clear heaven, the heavenly father; and man was the son of Tuisco and Hertha, heaven and earth.”*

11. *The Norse Kosmogony.*

In the beginning there existed two regions, one cold and low, and far to the north, Niflheim, “the mist-world”; the other hot and high, and far to the south, Muspelheim, literally, “home-of-the-spoiler-of-wood,” i.e., the fire world. In this latter region reigned Surtr, “the dark red,” the lord of heat. Between them was Ginungagap, “the yawning abyss”; and when in this third region the hot blasts from the south met the frozen vapour from the north, the latter melted into drops which became a giant-man, Ymir, “the roarer,” also called Aurgelmr, “the wet-clay-mass,” chaotic matter. From the rime-drops was further produced a cow, named Audhumbla, “the treasure of moisture,” whose milk fed Ymir, and who, by licking the salt† rime-stones, produced a man, Buri,‡ “the Generator,” who had a son named Bor,§ “the Begotten”; and he married Bestla, “Desire,”|| daughter of the giant Bolt-horn, “Kernel-of-the-globe”||; their children were Odhinn, Vili, and Ve, who slew Ymir, and from his body, bones, and blood formed earth, heaven, and sea, in kosmic order. At each of the four quarters they placed a dwarf-guardian and sky-supporter; the names of these dwarfs were Nordri, Sudri, Austri, and Vestri. Subsequently Odhinn, as mentioned, with Hoenr and Lodr, animated Ask, “Ash,” and Embla, “Alder,”|| the first man and woman. The Kosmos ultimately contained nine worlds, situate for the most part directly one below the other; (1) Muspelheim, in the highest part of which is Gimli,¶ “Heaven,” the ultimate abode of the righteous; (2) Asaheim, the world of the gods, the ethereal expanse; (3) Vanaheim, the abode of the Vanir, the aerial expanse; (4) Ljosalfaheim, “the world of the light elves”**; (5) Mannaheim, the world of man, Midgard,†† “the central enclosure,” surrounded by the

* *The Good News of God*, 241.

† Salt typifies the power of motion, and hence of heat. Cf. Sk. root *sal*, “to move,” *sala*, “water;” Gk. *salo*, *hals*; Lat. *salum*, *sal*; Slav. *sol*; Eng. *salt*.

‡ “The forth-bringing, origin, source” (Thorpe). Cf. Sk. *bhu*, “to be.”

§ The born, bairn. Cf. Lat. *puer*.

|| Bunsen.

¶ Or Gimil, Germ. *Himmel*.

** Alfr. Ang.-Sax. *Aelfenne*, “The White-beings.” From the root *alf*, *alb*, *alp*.

†† In the Christian epic the *Heljand*, i.e. “Healer,” “Saviour.” 9th cent. the earth is called *mittelgarten*.

Ocean-stream, beyond which is, (6) Jotunheim,* the abode of the Giants, the rude chaotic powers of nature who oppose the kosmic gods. Below the earth-plain is (7) Svartalfaheim, "the world of the dark Elves"; below which is (8) Helheim, the world of the dead, abode of the goddess Helt, "Darkness." The lowest deep is (9) Niflheim, "the mist-world," where dwells the serpent Nidhoggr, which constantly gnaws the third root of Yggdrasil, "the Bearer-of-the-deep-thinker," (*i.e.*, the Alfadir), the mighty mundane ash-tree, which spreads through all worlds except the highest.

A certain obscurity as to how Mind began to act pervades the commencement of this cosmogony; but we read that the melted drops quickened into life "by the might of him who sent the heat"; so that Mr. Martineau's canon is satisfied,— "Mind is first, and reigns for ever." In the Younger *Edda* the Supreme God, or Alfadir, is said to live for ever, to govern and direct all things, great and small, to have formed heaven, earth, and air; to have made man, and given him a spirit that shall live after the body has perished, and to have prepared a place called Gimli, where ultimately the just shall dwell with him. And this Being is clearly distinct from the Odhinn of the formal and completed Pantheon. It is quite possible that these statements may all be genuine and original; but we must remember that the compilers of both *Eddas* were Christians; and it seems to me that we have here some touches from a Christian hand dexterously interwoven into the original fabric. In the *Elder Edda* there are also two passages which should be considered in this connection:—

"Then shall another come Yet mightier, Although I dare not His name declare.	Few may see Further forth Than where Odhinn Meets the wolf."
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And in the *Voluspa* we read that in the happy times after Ragnarok:—

"Then comes the Mighty One To the great judgment, The powerful from above, Who rules o'er all.	He shall dooms pronounce, And strifes allay, Holy peace establish, Which shall ever be."
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* The Giants are called Jotunn, "eaters, voracious." Cf. Ang.-Sax. *ceten*, Lat. *edo*, etc.

† Cf. Sk. Kali, "the Black"; Ang.-Sax. *Hel-an*, "to cover over," etc.

‡ "He who sent forth the heat is not Surt, who is only the guardian of Muspelheim, but a supreme ineffable being" (Thorpe, *Northern Mythology*, i. 1, 3, note 5).

§ *I.e.* in the Ragnarok-contest (*Lay of Hyndla*, 42).

|| *Voluspa*, 64.

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* *The Good News.*

† Salt typifies fire, and bone of bone, Cf. Sk. *salt* and *skal*.

‡ "to move," *vala*, "salt.

|| "The fort."

§ The tree.

¶ Or Gud.

** Alfr.

alb. alp.

†† In

the *enclosure*.

Ocean-stream, beyond which is, (6) Jotunheim,* the abode of the Giants, the rude chaotic powers of nature who oppose the kosmic gods. Below the earth-plain is (7) Svartalfaheim, "the world of the dark Elves"; below which is (8) Helheim, the world of the dead, abode of the goddess Helt, "Darkness." The lowest deep is (9) Niflheim, "the mist-world," where dwells the serpent Nidhoggr, which constantly gnaws the third root of Yggdrasil, "the Bearer-of-the-deep-thinker," (i.e., the Alfadir), the mighty mundane ash-tree, which spreads through all worlds except the highest.

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Few may see
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Meets the wolf."[†]

And in the *Voluspa* we read that in the happy times when

Ragnarok

"The

To

The

He

Mighty One He shall discern
In judgment, And steeds afar,
To whom he is above, Holy power installed,
Which shall over

storm-
affords a
the giant-

akhsh or Drug,
announcing spectre,

"...ed into this universe and shares its fate".
of contact between the Norse kosmogony and other
Appendix C.

^{197). —} *Grimnismal*, 34-5.

The former passage seems to be genuine, the writer appearing to be conscious of a mightier Being than the nature-power-gods, who necessarily will be involved in the ruin of nature; but the latter is more probably a Christian addition to the *Voluspa*, and is not found either in the oldest restored text or in the Copenhagen MS. Thorpe and Anderson, however, accept it.

The wonderful kosmogony works out thus:—At the earliest period we can imagine, there existed the potentialities of heat and not-heat (Surtr being the personified genius of the former), and an unknown power the Heat-sender. The combination of heat and not-heat, which was arranged by the Heat-sender, produced Chaos, which has two great aspects, (1) an evil one, as being the opponent of order, and hence of light and good—Ymir; (2) a good one, as the mother and precursor of a better state of things—Audhumbla.* Hence, under the influence of Audhumbla, appears a being in human form, a father (Buri), who forms a triad with a son (Bor), and personified Desire (Bestla), i.e., wish to benefit all things, godlike love. From these spring a second triad, Odhinn, Vili, and Ve, i.e., the pervading will of the Sacred One, which makes Chaos into Kosmos, so that both Ymir and Audhumbla pass away. Buri, Bor, and Bestla, have no history; they are not personages, but anthropomorphic expressions by which man's struggling sense endeavours dimly to indicate the progress of divine energy in the universe. Vili and Ve are likewise only expressions and personifications of the same sacred action; but Odhinn is a personage to the mind of the Norseman, and so rises higher in the religious scale, and becomes identified with the All-Father, the Asa-Asura, Zeus-Tyr. Yggdrasil is a pictorial representation of the present kosmos, or orderly heaven and earth; and as the Alfadir fills these, so he is said to hang upon Yggdrasil.† This is the grand meaning of the mysterious verse in which Odhinn declares:—

* The nourishing power (cow) through motion (salt) produced hair, head and human form; or vegetable, intellectual, and animal life (vide Thorpe, *Northern Mythology*, i. 140).

† "This mighty ash-tree in Grimm's belief is only another form of the colossal Irmiasul, the pillar which sustains the whole Kosmos, as Atlas bears up the heaven. Virgil speaks of the ash-tree as stretching its roots as far down into earth as its branches soar towards heaven" (Sir G. W. Cox, *Mythology of the Aryan Nations*, ii. 19). "According to the old scholiast on Adam of Bremen such a tree [i.e. with three roots]—which was green both summer and winter—stood near the ancient temple at Upsala; near which was the sacred spring, into which the offerings were sunk" (Thorpe, *Northern Mythology*, i. 155). Thorpe adds, "The myth is both Indian and Lamaic. The tree of life gathers around it all higher creatures in one worship, as the earthly offering-tree assembled all followers of the same faith under its overshadowing branches.")

"I know that I hung
Nine whole nights,*
And to Odhinn offered,

On a wind-rocked tree,
With a spear wounded,
Myself to myself."†

But the present state of things is doomed to destruction in consequence of the restless action of the powers of evil, which practically constantly war upon it, and threaten to wear it out ; and so we read :—

" More serpents lie
Than any one would think
[Six serpents] the branches
Yggdrasil's ash,
Greater than men know of ;
And in its side it rots,
Under Yggdrasil's ash,
Of ignorant apes :
Ever lacerate.
Hardship suffers
A hart bites it above,
Nidhoggr beneath tears it."‡

At Ragnarok it trembles and groans, and is burnt in the general destruction.§

12. *The Opponents of the Gods.*

Having considered briefly the Norse divinities and the general kosmogonic scheme, I pass on to notice the habitual opponents of the gods ; in which number I include not merely those who are to take an active part in the Ragnarok-contest, but also those personages of dread, evil, or malignant nature who are opposed to purity or happiness. The principal members of this list are :—

Angurbodha. "Messenger-of-fear." A giantess, who by Loki became the mother of Fenrir, Hel, and the Midgardh-sormr. The original phase of this great Asiatic myth is simply the imagery of the storm. Fire, in its terrible and demoniac aspect (Loki), unites with the Thunder-cloud (Angurbodha) and produces darkness (Fenrir), which becomes nether-gloom (Hel), and also brings forth the storm-dragon (the Midgardh-sormr), which falls from heaven as rain. Odhinn is said to have hurled him into the sea. Vide *inf.* Loki, etc.

Beli. "The Roarer." A giant slain by Freyr, *i.e.*, a storm-wind allayed by the bright sunshine-power. Beli affords a good example of the hostile character and fate of the giant-powers.

Draugr. "Destruction." The Iranian Druksh or Drug. This being, in the Norse idea, a death-announcing spectre,

* A night for each world.

† *Hamaval*, 140. "He has entered into this universe and shares its fate" (Bunsen, *God in History*, ii. 407).

‡ *Grimnismal*, 34-5.

§ For some points of contact between the Norse kosmogony and other Aryan myths, vide Appendix C.

supplies a very interesting link between the Vedic, Iranian, and Scandinavian systems. "The evil against which good men are fighting is called *drukhsh*, 'destruction, or lie,'"^{*} and in the *Vedas* the Druh is personified as a female demon,[†] as is the Drug, "inactive, inglorious, and fiendish," in the *Avesta*.[‡]

Egdir. "Eagle." A terrible bird that keeps watch for the giantess Angurbodha; at Ragnarok it shall appear, scream, and tear corpses with its beak. The howling wind on the hill-tops. Cf. the connection in idea between *aquila* and *aquilo*.

Fenrir. "Dweller-in-the-depth." "The fennes hyde hi with their shadowe." (Job xl. in Bible of 1551). A demon-wolf, offspring of Loki and Angurbodha, bound by the gods in a lake of blackness, Amsvartnir, in the Under-world. At Ragnarok he is to break loose and devour the sun and Odhinn, an illustration of the solar aspect of the latter. Fenrir represents chaotic darkness; and thus Ragnarok is a "wolf-age," when "The sun darkens, Fall from heaven The bright stars,"[§] and another wolf || shall swallow the moon.[¶]

Garmr. "Swallower." A hell-hound, largest and fiercest of dogs, confined in Gniphellir, "the Holding-cave," whence at Ragnarok he shall break forth and fight with Tyr. Another form of the monster of darkness kept down by the bright powers; so it is an Eddaic caution that "a hero must never fight towards sunset."^{**} "The dog is scarcely distinguishable from the wolf in the twilight"^{††} of mythology. Garmr is a variant phase of Sarvari—Kerberos.^{‡‡}

Grabakr. "Gray-back." One of the dread brood of serpents in Niflheim, who are ever gnawing at the third root of Yggdrasil. Serpents in the Norse mythology are invariably connected with evil and chaos, although they hold positions widely different in some other schemes.^{§§}

* Haug, *Essays on the Parsis*, 304.

+ Vide Darmesteter, *Ormazd et Ahriman*, 266.

† Sk. root *druh*, "to seek to hurt;" cf. Lat. *trox, atrox*; Irish *droch*, "evil."
§ *Voluspa*, 56. || Vide *Managarmr*.

¶ For illustration of the gloomy and demoniac character of the mythological wolf, vide Gubernatis, *Zoological Mythology*, ii. 147-8.

** Cf. the Vedic dictum, "The evening is not for the gods; it is unacceptable to them" (*Rig-Veda*, V. lxxxvii. 2).

†† *Zoological Mythology*, ii. 34. Prof. Gubernatis gives many curious illustrations of the connection between the mythological wolf and darkness. Cf. the popular saying, "Dark as a wolf's mouth." †† Vide Appendix C.

§§ I have elsewhere (*The Great Dionysiak Myth*, ii. 67, *et seq.*) considered the mythological serpent in its connection with wisdom, the sun, time, and eternity, the earth-life, fertilizing moisture, and phallic symbolism.

Hel. "The Black." Goddess of death, cast down by the All-Father into Nifheim. A personification of the darker aspect of a future existence.

Hraesvelgr. "Corpse-devourer." A giant clad in eagle's plumage, who sits at the northern end of heaven, and from whose wings comes the wind. (Cf. *Egdir*). Wind-powers of course come into great prominence in stormy regions; hence the importance of the wind-aspect of Odhinn. These myths belong to a period when the wandering Aryans had colonized the wild North.

Jotunn. "Eaters." The Giants; unruly, devonring, turbulent powers of nature, who are especially opposed to and overthrown by Thorr, the bright champion of kosmic order, on the establishment of which they were driven beyond the ocean-stream to Jotunheim, the Utgard or Outer-world. Amongst them are such beings as Beli* and Hrungnir, "the Heaped-up" (i.e., rude, wild mountains), who was slain by Thorr. Their original sire was Ymir. Cf. the Greek Titans. In illustration of their opposition to the bright-powers, we find that "both giants and dwarfs shun the light. If surprised by the breaking-forth of day, they become changed to stones."†

Loki. "The Shiner," i.e., Fire.‡ The evil-aspect of the fire-power, which originally as Lodr, beneficent "Warmth," played an important part in the animation of man. Loki, by his tricks and recklessness, constantly endangered the gods, who at length bound him; but he will break loose at Ragnarok and especially oppose Heimdallr; he also, as noticed, became the sire of the great monsters and a representation of evil.

Managarmr. "Moon-swallowe." A wolf, offspring of Loki, who at Ragnarok shall swallow Mani, the moon; the sun and moon are constantly pursued by the wolves of darkness, who will at length overtake them.§

Midhgardhsormr. "The Serpent-of-Midgard." Midgard is the earth as the kosmic centre-point; and in the aerial heavens originally rages the serpent, snake, or dragon of storm and darkness, the Vedic *Ahi*|| and *Vritra*,¶ the Ira-

* Vide *sup.* *In voc.*

† *Northern Mythology*, i. 8, note 3.

‡ Sk. root *lok*, "to shine;" old Norse *logi*, "flame;" etc.

§ Vide *Garmr*. In this connection we may remember "the Manducus, a symbolic effigy with gaping jaws which was borne aloft in Roman games and processions to represent the under-world" (Rev. Isaac Taylor, *Etruscan Researches*, 121).

|| The "Binder," "Strangler"; Sk. root *anh*, "to press together;" Gk. *echis*, *echidna*.

¶ The "Coverer"; Sk. root *vri*, "to cover." In Vedic mythology *Vritra* personified as a rain-restraining demon.

nian Ajis Dahaka, "Biting-snake," who in later tradition appears as the Perso-Arabian giant Zohak. The storm, offspring of the thundercloud (Angurbodha), is cast from heaven as rain, and becomes identified with the lower storm of water, i.e., the sea; into which, accordingly, Odhinn, as the heaven-ruler, hurled the Midbgardhsormr. Here the monster grew to such a size that with tail in mouth he surrounds the world, and so is Jormungurdr, "Earth-encircler," and Weltums-panner, "Stretcher-round-the-world;" i.e., he became identified with the ocean, into which he had been cast. In the contest with the gods he is specially pitted against the equally-extended Thorr. The translator of Mallet's *Northern Antiquities*, edit. 1770, well observes: "We see plainly in the above fable [i.e., myth] the origin of those vulgar opinions entertained in the North, and which Pontoppidan has recorded, concerning the Craken, and that monstrous Serpent, described in his *History of Norway*."^{*} In an ancient Akkadian Hymn we read, "The thunderbolt of seven heads, like the huge serpent of seven heads (Ibear); like the serpent which beats the sea, (which attacks) the foe in the face."[†] The sea here referred to was probably originally the Oversea, the "mare magnum sine fine." Again, the "Lernaeus turbâ capitum angnis" seems similarly to have originally represented the many-headed, changing storm-clouds."[‡]

Nidhoggr. "Gnawing-serpent."[§] The fell hell-serpent that with numberless other snakes dwells in a well under one of the three roots of Yggdrasil, which it constantly gnaws; and it also sucks or shall suck the bodies of the wicked dead. Goranson, in his Latin version of the *Younger Edda*, renders the passage, "Ibi enim Nidhoggius (Diabolus) excarnificat cadavera mortuorum." Anderson styles Nidhoggr, "The dragon of the uttermost darkness." It is animated by a hatred of what a Zoroastrian would call the "good creation," and is thus an opponent of kosmic order.

Another drakontic monster, but one which belongs to the cycle of the heroes and their exploits, is Fafnir, a name akin to the Greek *thrē*, *Aeol. phēr*, Latin *fera*, English *deer* (a good example of restricted meaning of a term once general), who guarded treasure on a heath, and was slain by the solar hero Sigurd, who, concealing himself in a pit (the Under-world), pierced Fafnir (the nocturnal-darkness) to the heart with his sword (ray) as the monster passed over the pit's mouth.

* Vol. ii. 136, note.

† *Apud Records of the Past*, iii. 128.

‡ Cf. *Mythology of the Aryan Nations*, ii. 48.

§ Thorpe. Perhaps "murderous-biter."

Surtr. "The Dark-red." The principle of primeval fire. Although distinct in character from the foregoing personages, he will join with them in the great assault on the present state of things, and will burn the world.

13. *Analysis of the Opponents of the Gods.*

The foregoing fifteen personages on analysis appear as follows:—

I. *Phenomenal Objects.*

1. *Rude Nature-forces.*

Jotunn.

2. *Fire.*

Loki (malignant fire).

Surtr (primeval fire).

3. *Storm.*

Angurbodha.

Beli.

Egdir.

Hraesvelgr.

Midhgardhsormr.

4. *Darkness.*

Fenrir.

Garmr.

Grabakr.

Hel.

Managarmr.

Nidhoggr.

II. *Abstractions of Evil.*

Draugr.

Loki (malignant mind).

Nidhoggr (diabolical hate).

General character of the personages—opponents of existing cosmic order.

I necessarily pass over unnoticed a large number of minor incidents and features in the Norse scheme, although many of them are of very considerable interest. My principal object is to supply a general, and also to some extent a comparative, view, and the foregoing analysis will enable us to consider the nature of the contest of which the earth and its surroundings are regarded as the scene. This is the warfare of darkness against light, disorder against order, storm against serenity, destruction against renovation, and evil against good. I place the bad powers first, as they are the aggressors. Now, one of the most common views of the day with respect to mythology and religion, is that the latter sprang from the former; that is to say, that the physical world supplied the human mind with the idea of contest; that "good" was originally a term equivalent for that which seems to be immediately beneficial to man, and "evil" for that which seems to be immediately injurious to him; and that in subsequent ages, under the expanding

power of the mind, the physical struggle in nature was spiritualized ; abstract ideas, such as good and evil, entered the field of human reason, and ultimately Religion, i.e., mythology-with-a-bad-memory, appeared upon the scene. This subtle position, in itself so lucid and apparently so truly scientific, one, moreover, which appears to be capable of being illustrated by an almost infinity of instances, many of them startling in their seeming appropriateness, and which if true would simply annihilate Religion as we understand the term, inasmuch as in this case Religion would have sprung from man and not from God, this most dangerous mythological half-truth, is chiefly supported ;—

1. By previous failures to explain the system of mythology, especially by crude-historical* (Euemeristic†), allegorical,‡ moral, or metaphysical§ (so-called) explanations.
2. By the undoubted exceedingly important part which natural phenomena have played in mythology, and in connection with the religious thought of archaic man.
3. By the previous absence of any searching analysis, which, whilst accurately setting forth the sphere and influence of the physical, will show that there is also another element in primitive idea.

Thus, in the foregoing view of the gods and their opponents, we see at a glance how large is the part played by the physical ; the representatives of darkness, disorder, storm, and destruction do not necessarily postulate any element of metaphysical or moral evil. We can trace the career of the great sea-serpent from the Oversea to the Ocean-stream, and from the climate of Central Asia to the pages of Aldrovandus|| and Pontoppidan ; but that fact is no more conclusive against the occasional use by archaic man of the serpent as a symbol of moral evil, than it is proof positive that no large marine monster has ever actually existed. When we have removed all personages who are merely representatives of natural phenomena from both sides, there is a most important residuum. On the one

* Thus, Jupiter, even in recent editions of the *Encyclopaedia Britannica* appears as a king of Krete ; and Odhinn has often been described as a friend of Mithrdates, who fled to the North from the Romans.

† Euēmeros, B.C. 316, "dressed up the myths as so many plain histories" (vide Grote, *History of Greece*, Part I. cap. xvi. ; Sir G. W. Cox, *Mythology of the Aryan Nations*, vol. I. cap. ix.).

‡ The Baconian. Thus, according to Lord Bacon, the sharp and hooked talons of the Sphinx represent "the axioms and arguments of science."

§ The Neo-Platonic (vide *The Great Dionysiak Myth*, i. 66, *et seq.*). These pretended explanations are quite arbitrary, and therefore worthless.

|| *Serpentum et Draconum Historia*, 1640.

hand appears a God-power, beneficent, sustaining, renewing, a divine Will, who gave to the residue of existence its commencement and what potentiality it has. On the other hand is an Evil power, animated by a malignant hatred against good and against man, a power which allies itself with, and whose action is illustrated by, the hurtful agencies of nature, as the God-power is illustrated and revealed by the beneficial. It is a natural thought,—but if the Midhgardhsormr is merely an aspect of nature, why should Nidhoggr be more? If Surtr is merely an igneous personification, so is Loki. This idea, which, logically regarded, is only saying, If A is an Englishman, so is B, will be rebutted by an examination of the story. Thus, the Great Serpent is never represented as directly attacking any man, because the rage of storm, aerial or oceanic, is never directed against individuals as such; whereas Nidhoggr, on the other hand, is constantly assailing, both verbally* and by deeds, the powers of good who maintain the order of the world, and has special power and office in connection with the wicked dead. Loki, a fallen god, is an equally remarkable concept.

Many may think such inquiries as the present unimportant, but the grand question of the truth of Religion will, so far as general argumentation is concerned, have a growing tendency to revert to its origin as far as known, and thus to bring us face to face with the opinions and belief of archaic man.

14. The Law of Kosmic Order.

It will be observed that the foregoing view of ontology assumes the habitual triumph of the principle of kosmic order, against which the evil-powers constantly vainly strive. Far from being of the opinion expressed by a modern that "Nature ought to be hung at the Old Bailey," archaic man devoutly believed, nay, more, exceedingly rejoiced in the grand harmony of existence, although its conditions were often infinitely sterner than those which are presented to ourselves. The doctrine that blind chance or unreasoning and accidental atom-play had produced the Apparent, would have been an idea almost utterly unintelligible to him; and when he had painfully grasped it, he would have unhesitatingly rejected it as an impious absurdity. This belief in universal order took a tangible shape in the Vedic concept Rita, whose Baktrio-

* A curious feature in the Norse kosmic myth, is the squirrel Ratatosk, perhaps "Wandering-whisperer," who runs up and down Yggdrasil bearing rancorous words between the dragon-serpent Nidhoggr at the bottom and a wise eagle who sits at the top.

Iranian equivalent is *Asha*.* *Rita*, from the Sanskrit root *ri*, "to go," signifies (1) going, motion, flowing; (2) a stream, i.e., that which is ever going and flowing; (3) a course, line, i.e., the way taken in going; (4) method, manner, fashion, i.e., the usual way in which people go; and hence (5) usage, observance, custom. Derivatives prove that along with *asha*, existed a variant form *arta*, and the Sanskrit root *ri* sprang directly or indirectly from a Proto-Aryan root *ar*, "to go;"† so that *rita* (*arta*) and *asha* have a common origin, the word and the idea alike belonging to the period of Indo-Iranian unity,‡ and doubtless also to a much earlier stage of Aryan history. *Rita* is used in the *Rig-Veda* as a representation of kosmic order;§ "the going, the procession, the great daily movement, or the path followed every day by the sun from his rising to his setting, followed also by the dawn, by day and night,|| and their various representatives, a path which the powers of night and darkness could never impede."¶ This *Rita-path* is said to have been made by *Varuna*** for the sun to follow;†† the dawn also follows it,†† but evil-doers never cross it;§§ and "the law of *Rita*" is identified with "the law of *Varuna*,"||| that is to say, kosmic order is an ordinance of the Supreme.

When considering the myth of Kadmos, "the Easterner," and his bride Harmonia, a Phoenician personage with an Hellenic name, I observed that the term *harmonia* includes "any means of joining things," as a joint or clasp. "Hence it is used of immaterial clasps, as covenants, leagues, laws; and these strongly conveying the idea of orderly management, it becomes connected with proportion, i.e., due proportion in architecture, sound, or character. Hence it is more specially applied to cadence and modulation, and so the full meaning of the word is That-which-is-fitted-together-in-due-proportion. But in a Phoenician and kosmogonical connection that which is fitted together in due proportion is the Kosmos itself; and similarly the Pelasgoi called the gods Disposers (theoi),¶¶ "because they had disposed and arranged all things in such a beautiful order."*** In this connection let

* Vide *Zoroaster*, sec. 14.

† Vide Appendix B.

‡ Vide Darmesteter, *Ormazd et Ahriman*, 16.

§ *Ibid.* 1.

|| Kosmic Night (Hodhr), distinct from the malignant aspect of darkness.

¶ Prof. Max Müller, *Lectures on the Origin and Growth of Religion*, 239.

** Gk. *Ouranos* (vide *Zoroaster*, secs. 26, 33), the Asura.

†† *Rig-Veda*, I. xxiv. 8. †† *Ibid.* I. cxxiv. 3. §§ *Ibid.* IX. lxxiii. 6.

||| *Lectures on the Origin and Growth of Religion*, 243.

¶¶ *The Great Dionysiac Myth*, ii. 236.

*** *Herodotos*, ii. 52. A derivation, of course, "purely fanciful."

us take three strictly parallel sayings from the *Rig-Veda*, the *Psalms*, and a Greek philosopher, in order to show how widely and firmly belief in the splendid principle of kosmic order is rooted in the ancient mind:—

“Surya does not injure the appointed places.”*

“Helios† will not overstep his bounds; if he do, the Erinyes,‡ the auxiliaries of Justice, will find him out.”§

“The sun knoweth his going down.”||

Do not fear this juxtaposition of passages, or suppose that I regard the Psalmist as exactly on a level with the Hindu and Greek sages; but, again, do not let us for a moment suppose that the Hebrew monopolized ancient belief in “a faithful Creator” who kept covenant with man in nature as well as otherwise. And this law of Kosmic Order, thus rightly accepted by the archaics, leads us up to the Argument from Design, respecting which I can only remark here that if there were no such thing as general harmony in nature, if e.g., the movements of the sun were altogether eccentric, and men were now frozen, now scorched; if herrings filled the sea whilst rabbits covered the land; if twenty males were born to one female; then how fiercely would the Argument from Design be attacked by the opponents of the belief in the existence of Deity. But it is fiercely attacked by them now, and pronounced to be valueless; therefore, happen what may, they are prepared to object and to deny.¶

15. Ragnarok.

Such being the general conditions of the present existence, and such the opposing forces discovered in it, the next inquiry

* *Rig-Veda*, III. xxx. 12.

† Surya, Helios, and Sol are variant phases of the same name, which means “the Shiner.” Apollo=“Son-of-the-revolving-one” (Sayce).

‡ As to Eriny, the Vedic Saranyu, i.e. “the running-light” of morning, vide *The Great Dionysiak Myth*, i. 309, and authorities cited.

§ Herakleitos, *Apoepamnia*, xxxiv. || Psalm civ. 19.

¶ The principle of kosmic order and its contest with chaotic violence and evil are admirably illustrated by the Akkadian legend of *The War of the Seven Evil Spirits against Heaven* (translated by Geo. Smith, *Assyrian Discoveries*, 398, and H. F. Talbot, in *Records of the Past*, v. 161, *et seq.*). The form of the two first spirits is unknown; but the second, third, and fourth seem to have resembled a leopard (a nocturnal symbol, vide *The Great Dionysiak Myth*, i. 196; ii. 9; cf. the Fenrir-wolf), snake (cf. Nidhoggr), and dog (cf. Garmr). “The sixth was an enemy to heaven and its King” (cf. Loki); “the seventh was a destructive tempest” (cf. the Midhgardhsormr). “Against high heaven, the dwelling-place of Anu the King, they plotted evil,” and advanced against “the noble sun” (cf. Odhinn), and “Im the Warrior,” “who answers to the Jupiter Tonans of the Latins” (cf. Thorr). It is a kind of primeval Ragnarok contest.

is,—Will this state of things be permanent? and the answer given by the Norse religions-mythology is that it will not. A moment of supreme crisis will arrive in which the ever-opposing forces, who may be briefly described as the Powers of Good and Evil, will engage in a decisive and intensified contest called Ragnarok,* “the Twilight-of-the-gods.” The first sign of this terrible event will be the gradual increase of human wickedness :—

“ Further forward I see,	Much can I say
Of Ragnarok	And the gods conflict.
Brothers shall fight,	And slay each other ;
Cousins shall	Kinship violate.
No man will	Another spare.
Hard is it in the world,	Great whoredom ;
An axe age, a sword age,	Shields shall be cloven,
A wind age, a wolf age,	Ere the world sinks.” †

Three winters of bloodshed and general disorder will be followed by the terrible Fimbulvetr, “mighty-winter,” or three winters of severe cold, when the sun will lose its force. At length the Evil-powers will break their present restraints and make a general attack upon the world and the gods. The wolves who have so long pursued the sun and moon will overtake and swallow them; and “the bright stars fall from heaven.” † A golden-combed cock, type of the benevolent and beneficial solar power, will crow over the Aesir; whilst a lurid-red cock, type of the destructive flame, will crow in the Under-world. To the mighty plain called Vigridr, “Battle,” hasten the opponents of the gods; namely (1), Surtr, whose sword outshines the sun, and the genii of the fire from Muspelheim, who, as they march across the bridge Bifrost, break it in pieces; (2) Hrym, “Rime,” and the array of frost giants; and (3) Loki and his children, with the terrible dog Garmr, for Fenrir and Garmr have burst their bonds and come up from the Under-world, and the Great Serpent lashing the sea in fury comes forth against the gods and places himself by the side of the Wolf. Meanwhile, Heimdallr arouses the gods by terrific blasts upon the Gjallerhorn, and they gather upon the fatal plain, supported by the Einheriar, or “Great Heroes,” who, having fallen gloriously in battle have been received by Odhinn into Valholl, “the Hall-of-the-slain.” The contest begins. The solar Odhinn, with golden helmet and

* “From regin, gen. pl. ragna, deus, potestas, and röckr, twilight, darkness” (Thorpe, *Northern Mythology*, i. 205).

† *Voluspa*, 44–6. † *Ibid.* 56.

spear, opposes the wolf Fenrir; Thorr matches himself against the Midhgardhsormr which he had already previously assailed when out fishing in the deep wild sea; Tyr attacks the dog Garmr; Freyr opposes Surtr; and Heimdallr Loki; the Einheriar, we may suppose, are matched against the Frost-giants; and either host has a strong reserve-force; on the one side, Vidhr and Vali, on the other, Hel and Nidhoggr.

The battle goes hard with the gods ; Fenrir, whose upper jaw reaches heaven and his lower earth, swallows Odhinn, a reduplication of the swallowing of sun and moon by the other wolves. Thorr, "the Extended," whose bright potency fills the Oversea, pitted against the Serpent-undersea, crushes the monster's head with his club, and thus slays the "worm"; but, staggering back nine* paces, falls dead, suffocated with the outpoured floods of venom. Tyr and Garmr, and Heimdallr and Loki, mutually slay each other; and after a terrible contest Surtr beats down Freyr and fires the world. At this moment the reserve of the gods hasten forward to the rescue. Vidhr with colossal strength seizes the Wolf by the jaws, and rends him till he dies. But the whole contest is too terrible for man and nature to endure. Ghosts flock in crowds to the Under-world,† mountains are hurled down, all fetters and bonds break, universal fear prevails; the trembling Yggdrasil is set on fire, and the earth sinks down consumed whilst the dread flames roar up against the very heaven.

The previous analysis will have made this grand picture easily comprehensible. Darkness (Fenrir) veils the sun (Odhinn), but is in its turn rolled away by divine might in renewal and recreation (Vidhr). So sings the poet ;—

"The Wolf will
Him Vidhr will avenge ;
Will cleave The Father of men devour ;
He his cold jaws †
In conflict with the Wolf." &

The brightness of kosmic order in the heavens, with its thunder strength and lightning splendour (Thorr), and the fury of the chaotic storm and wild raging sea (the Midhgardhsormr) encounter, destroy each other, and pass away together, and the sea is not any longer. The bright brow of heaven (Tyr) encounters the chthonian darkness (Garmr), and they

* The number 9 contains a kosmical allusion to the nine worlds. The nine paces which Thorr retreats, show that he ceases to exist in any world. Similarly, Heimdallr is said to be the son of nine mothers, i.e., his influence extends throughout all the worlds.

† "All men will their homes forsake" (*Voluspa*, 55), i.e., die.

[†] Those who regard Fenrir as a symbol of subterranean fire have omitted to notice this expression. *Lay of Vafthrudnir*, 53.

mutually fall and disappear; as do the guardian heavenly fire (Heimdallr) and the demoniac telluric fire (Loki), when they close in contest. But the principle of primeval heat (Surtr) shall, at the general conflagration, triumph over the mild warmth of the kosmic world (Freyr), and complete the destined devastation. Surtr and Vidhr, twin powers of God, double aspects of one nature, remain triumphant on opposite sides, and do not attempt to assail each other.

16. Beliefs respecting the End of the World.

That the world, understanding by that term the present state of things, would eventually come to an end, and that by the instrumentality of fire, is an ancient doctrine, both traditional and philosophical. Thus, according to Herakleitos, of Ephesos, at a determined period, the world will disappear in fire, and then be built anew by the Deity.* This is also the usual doctrine of the Stoicks; at the termination of a certain occult kosmical period the world will perish in a general conflagration.† But the Magi and the archaic Iranians held a doctrine strikingly resembling the Norse faith, and so strong is the correspondence in many particulars that Waring observes,—“The whole scheme of Northern mythology appears to be a wild travestie of that of ancient Persia, combined with local and tribal legends.”‡ It might, of course, be said with equal truth that Latin is a travestie of Greek, but the quotation illustrates the remarkable parallelism between the beliefs of the Teutonic and Iranian branches of the Aryan race. According to the philosopher Theopompos,§ B.C. 340, the Magi were of opinion that Oromasdes (Ahuramazda) ruled alone for 3,000 years, after which Areimanios (Angromainyush) ruled for another 3,000. At the close of this period war commenced between them, and continues, but at length Areimanios shall perish, the dead will rise, men become immortal, will enjoy a blessed state of life, neither casting shadows nor requiring food. Hermippus, B.C. 250, the Greek most acquainted with Magism and Zoroastrianism generally, speaks similarly of the Magian belief in a grand crisis or consummation, when Arei-

* Vide Ueberweg, *History of Philosophy* (translated by Morris), i. 39, 41, and authorities cited.

† Vide Cicero, *De Natura Deorum*, ii. 46; Seneca, *De Consolatione ad Marciam*, 26. And the belief is echoed by the poets (vide Lucan, vii. 810; Ovid, *Metam.* i. 283).

‡ *Ceramic Art in Remote Ages*, 19, note.

§ Apud Plutarch, *Peri Isidis kai Osiridos*, 47; Diogenes Laertios, *Peri Biōn*, Introduction, 6: “Theopompos tells us that, according to the Magi, men will have a resurrection and be immortal, and Eudemos, of Rhodes, coincides in this statement.”

manios shall perish, and the earth under one rule shall be inhabited by happy men, speaking only one language.* In the *Bundahish†* (*Kosmogony*), which, in its existing form, is a Persian work of the period of the Sassanian dynasty, A.D. 226-641, is contained, amongst other things, an account of the Creation, of the conflict between the good and evil powers, of the future destiny of mankind, and of the general resurrection and Last Judgment. Of this book Haug observes that its contents agree "so exceedingly well with the reports of Theopompos and Hermippus, that we are driven to assign to the original or its sources, a date not later than the fourth century before the Christian era."‡ In the *Bundahish* we meet with a great kosmical period of 12,000 years, a term which also appears in Brahmanism,§ and in the kosmogony ascribed by Souidas|| to the ancient Tuscan. According to this later system, the Demiurge consecrated the period of 12,000 years to his works as at present existing; in the first thousand years, he made heaven and earth; in the second, the firmament; in the third, the sea and waters; in the fourth, sun, moon, and stars; in the fifth, animals, except man; in the sixth, man; the human race, therefore, will continue for six thousand years. With this whole period the writer connects the twelve houses of the sun or signs of the zodiac. The cycle, therefore, is derived from an intensification of the ordinary year. Of this system M. Darmesteter observes, "This pretended Etruscan kosmogony is merely a fusion of the Biblical kosmogony and that of the Bundehesh: on the one hand, the creations of the first six thousand years correspond to those of the six days; on the other hand, there are twelve thousand years, as in the Bundehesh,"¶ in which also it is explained that "each 1,000 years, each month of the world, is under the sway of one of the signs of the zodiac." It is quite possible that Souidas, or the writer in his *Lexicon*, derived a portion of the above kosmogony from Biblical sources, but we must remember in this connection the statement of Plutarch respecting the prodigies which occurred at the time of the civil wars between Marius and Sulla. He says,—"One day, when the sky was serene and clear, there was heard in it the sound of a trumpet, so loud, so shrill, and mournful, that it frightened and astonished all the world. The Tuscan sages said it portended a new race of men, and a renovation of the world: for they observed that there were eight several kinds of

* Vide Plutarch, *Peri Is. kai Os.*, 47; Haug, *Essays on the Parsis*, 9.

† Translated by Justi in 1868.

‡ *Essays*, 33.

§ Vide Darmesteter, *Ormazd et Ahriman*, 300.

|| In voc. *Tyrrhenia*.

¶ *Ormazd et Ahriman*, 306, nota.

men, all different in life and manners : that Heaven had allotted each its time, which was *limited by the circuit of the great year.*"* It is evident, therefore, that the Etruscans† were well acquainted with a great kosmical period, which, in all probability, was estimated at 12,000 years, a term whose origin was, of course, subsequent to the development of a regular system of astronomy, and which nevertheless may be an idea of very remote antiquity, both on account of its wide-spread prevalence, and also since even the Akkadians, for instance, used the same zodiacal signs as ourselves.‡ With respect to the doctrine of the destined end of the world, it is not, I believe, asserted in any quarter that either Persian or Teuton borrowed the theory from Biblical sources.§ Winter appears at the close of the kosmical period as at the end of the ordinary year, and just as Hrym and the Frost-giants, with the Midhgardhsormr, are great opponents of the gods ; so Angromainyush is stated to have made in opposition to the first creation of Ahuramazda "a mighty serpent and frost."||

17. *The Regeneration.*

But in the grand Norse creed the scheme of existence is not to end with a vast catastrophe ; Ragnarok is to be followed by a re-creation, a new heaven and earth wherein dwelleth righteousness. The potencies and principles of renewal have survived the conflagration ; Thorr and Odhinn have passed away for ever, but Thorr's offspring, Magni, "Might," and Modi, "Courage," with Vidhr, a greater Odhinn, remain uninjured. The wise and gentle Baldr, erst slain by the darkness, shall return in immortal splendour ; Vali, the "Vigorous," will beam again upon a happier world, for lo, the sun, although wolf-devoured, has left a daughter more beauteous than herself, as it is written, "A daughter shall the sun bring forth ere Fenrir destroys her. The maid shall ride on her mother's track when the gods are dead."¶ Nor is man forgotten ; in a mysterious grove called Hoddmimir's Holt, were concealed unhurt during the Ragnarok contest and the ensuing conflagration a man and a woman, Lifthrasir,** "Life-raiser," and

* *Life of Sulla.*

† Vide Appendix D.

‡ Vide *Records of the Past*, i. 64. It is quite possible that the zodiacal signs, and the use of a great kosmical period not unconnected with them, may hereafter appear as a link between Etruria and Akkad.

§ "In the present state of our knowledge on this subject, it is quite unnecessary to bring forward detailed proofs of the autochthonic origin of this conception of the ancient Teutons" (Bunsen, *God in History*, ii. 492).

|| *Vendidad*, i.

¶ *Gylfaginning*, 53.

** "Force vitalc" (Darmesteter).

Lif, "Life," from whom will spring another and a happier race ; that is to say, the eternal life-principle of the righteous will pass unscathed through the great crisis at the end of the age. Mimir, whose name means " Possessing Knowledge,"* was the giant-guardian of the spring or well under one of the roots of Yggdrasil, and physically represents the ocean as encompassing the foundation of the world ; so his sons, *i.e.*, the waves, dance at Ragnarok,† and Odhinn leaves his eye, *i.e.*, the sun, in his well as a pledge.‡ Odhinn used Mimir's head, which had been cut off by the Vanir, as an oracle,§ and mention is made of a mythic tree, distinct from Yggdrasil, and called Mimameidir, "Mimir's Tree," which no fire shall harm, and which is a creator of mankind,|| a kind of tree of life. The connection between the deep, the ocean, and wisdom, is both very archaic and very occult ;¶ but I am unable further to consider it here.

Hoddmimir signifies "Circle-Mimir," or "Sphere-Mimir,"** that is to say, the physical Mimir or ocean, like the Midgardhsormr, encircles the earth, and when the latter is consumed, the selected members of the human race are safely conveyed away across ocean to the far ocean-grove. M. Darmesteter calls the "bois Hoddmimir equivalent du frère Yggdrasil,"†† but this is not the case, nor is this grove a "dedoublement" of Yggdrasil (the present state of things) which is destroyed. We here, in fact, encounter another occult and archaic myth, the Grove of the Under or Unseen World. It is connected with the Under-world because it lies in the direction pursued by the sinking sun. The Greeks knew it well. Thus we find it in Homer,—" When thou hast sailed in the ship across the stream Okeanos (Hodd-mimir) where are groves of Persephoneia, poplars and willows."†† Stesichorus, B.C. 632–552, tells how Helios, like the Vedic Yama,§§ found out the way and sailed in his golden boat-cup

* Cf. the Sk. root *mi*, "to measure, judge, observe," akin to the Proto-Aryan root *ma*, "to measure, gush forth." Lat. *memor*, Ang.-Sax. *meomer*.

† *Voluspa*, 47.

‡ So, according to the *Rig-Veda* (X. lxxii. 7), Surya (Helios-Sol) was drawn by the gods from the ocean where he was hidden.

§ *Voluspa*, 47.

|| Vide *Fjölvinnsmal*, 20-3.

¶ Cf. the Akkadian divinity Hea, lord of the deep and of deep wisdom.

** Thorpe, *Northern Mythology*, i. 158.

†† *Ormazd et Ahriman*, 299.

†† *Odysscia*, x. 508. So, again, according to Egyptian belief, in Amenti (Hades) were sacred cypress-groves, guarded by fire-breathing, solar Arani (cobras).

§§ Vide *Zoroaster*, sec. 24.

o'er ocean to see his dear ones in the sacred laurel* grove;† and Mr. Ruskin, in a grand passage, exclaims :—"The poor Greeks of the great ages expected no reward from heaven but honour, and no reward from earth but rest; though, when on these conditions, they patiently and proudly fulfilled their task of the granted day, an unreasoning instinct of an immortal benediction broke from their lips in song; and they, even they, had sometimes a prophet‡ to tell them of a land 'where there is sun alike by day, and alike by night, where they shall need no more to trouble the earth by strength of hands for daily bread, but the ocean breezes blow around the blessed islands, and golden flowers burn on their bright trees for evermore.'§ And such is "Hoddmimir's Holt,"|| which flame and tempest cannot touch.

A new earth rises in fresh beauty; the Aesir meet again, speak of the wondrous things of yore, and reign in peaceful splendour. And the Vala, in her prophecy, exclaims :—

" She sees arise,	A second time,
Earth from ocean,	Beauteously green,
Unsown shall	The fields bring forth.
All evil be amended.	
She a hall sees standing,	Than the sun brighter,
With gold bedecked,	In Gimil :
There shall the righteous	People dwell,
And for evermore	Happiness enjoy."¶

Then follows the stanza beginning, "Then comes the mighty one," already quoted.** And such, according to the *Eddas*, is the glorious destiny of the righteous.

* I.e. "bright" grove. "The dawn was called δάφνη, the burning, so was the laurel, as wood that burns easily" (Prof. Max Müller, *Lectures on the Science of Language*, ii. 549, note; vide *The Great Dionysiac Myth*, ii. 26. In voc. *Philodaphnos*, an epithet of the solar divinities Apollon and Dionysos).

† Vide *Zoroaster*, p. 28, note 1.

‡ Pindar, *Olymp.* ii.; cf. *Od.* iv. 563, *et seq.* :—"The deathless gods will convey thee to the Elysian plain and the world's end, where is Rhadamanthos [the Egyptian Rhot-amenti, i.e., "Judge-of-the-Hidden-World," a title of Osiris-Dionysos] of the fair hair [cf. Dionysos Chrysokomes], where life is easiest for men. No snow [Hrym and the Frost-giants] is there, nor yet great storm [the Midhgardhsormr] nor any rain" (*apud* Butcher and Lang).

§ *The Queen of the Air*, i. 50.
¶ *Voluspa*, 57, 60, 62.

|| *Vafthrudnismal*, 45.
** *Sup. sec. 11.*

18. *Odhinn and the Supreme Aryan God.*

We have already noticed* that the undivided Aryans worshipped a supreme god whose name implied either—

1. *Existence*, e.g., Asura, Ahura, (As plu., Aesir), Aesar, Hesus, etc.

2. *Brightness*, e.g., Dyaus, Deva, Zeus, Theos, Ju-piter, Deus, Svar-ogni, Tiu, Zio, Tyr, Taith, etc. ; or,

3. *The Coverer* (Proto-Aryan), Varana ; (Vedic), Varuna ; (Zend), Varena ; (Greek), Ouranos. And it will further be observed that Odhinn, the head of the completed Norse Pantheon, although at times almost spoken of as a supreme god, is nevertheless more or less faintly distinguished from the latter, possesses characteristics distinctly aerial and solar, which the supreme God does not, is overcome in the great conflict by the opposing evil power, a situation in which the supreme God is never represented ; and finally, is distinct in name from the Asura-Dyaus-Varana, thereby showing that he is also distinct in origin.

The explanation of this singular circumstance reveals an historical fact of great importance in the consideration of the history of religion, namely, that the Supreme Aryan God in the course of time was, with a single exception, *degraded* in the cult of his votaries. In India, Varuna was superseded by Indra, a local divinity, unknown to the Proto-Aryans,† and he had in turn to give way to Brahma. In Greece, Zeus sank lower and lower in general estimation, until the Aristophanic jest that Vertigo (Dinos) had expelled him,‡ became a most practical reality ; whilst in the Roman Empire, Jupiter was reduced by Mithra and Serapis to a petty planetary genius.§ Perkunas, the Hindu Parjanya, superseded the supreme Aryan divinity amongst the Lithuanians ; and, similarly, amongst the Germans and Scandinavians, Wuotan-Odhinn, the Hindu Vata, and like Perkunas and Indra, the lord of the stormy atmosphere, superseded Tiu-Tyr, who was relegated to a position altogether secondary. In Persia alone did the Aryan remain faithful, as the Parsi does to-day, to the belief in Ahura as the Supreme God.||

* Zoroaster, secs. 11, 12, 19, etc. ; sup. secs. 6, 7.

† Vide Zoroaster, sec. 19. In voc. *Indra* ; Darmesteter, *The Supreme God in the Indo-European Mythology* (in *The Contemporary Review*, Oct. 1879, p. 287) ; Muir, *Sanskrit Texts*, v. 121, et seq.

‡ *Nephelai*, 1471.

|| *Ibid.*, sec. 10.

§ Vide Zoroaster, sec. 15.

19. *The Law of Reduplication.*

The adherents of the theory of primitive fetishism, primeval barbarism, and the like, when hard-pressed by the evidence which shows the simplicity and purity of the religious views of archaic man, are wont to take refuge "in boundless time,"* where indeed they are perfectly safe from our pursuit. Thus Mr. A. Lang, in a recent criticism† of Prof. Max Müller's well-known views respecting fetishism, namely, that it is a "corruption of religion," is supposed to make "a distinct point" by "reminding us that the hymns of the Rig-Veda, to which Prof. Max Müller so constantly appeals, are not at all really early documents, or adapted to throw light upon primitive, untutored, religious sentiment." It would be very interesting to have a specimen of "a really early" document, a rather unfortunate term to apply to the Vedic Hymns, so long handed down by oral tradition. It may be that Vedic Hymns, Akkadian Tablets, and Egyptian Papyri are very late documents; but as "late" is merely a relative term, we should be glad to inspect older ones before so classifying them. But, in truth, the theory of the Fetishists may be crystallized into two cardinal positions, namely :—

1. Primitive man, about whom we *know* little or nothing, but dogmatize much,‡ was as we think him to have been.

2. There is nothing really ancient except the modern savage.

On this latter point it is well to hear Mr. Herbert Spencer, an authority as a rule by no means favourable to the views of the present writer. He well remarks :—

"To determine what conceptions are truly primitive, would be easy if we had accounts of truly primitive men. But there are sundry reasons for suspecting that existing men of the lowest types, forming social groups of the simplest kinds, *do not exemplify men as they originally were*. Probably most of them, if not all, *had ancestors in higher states*. . . . While the degradation theory, as currently held, is untenable, the theory

* Vide *Zoroaster*, p. 15, note 1.

† *Mind*, Oct. 1879.

‡ Vide the numerous wild statements in Stuart Mill's *Subjection of Women*, cap. i. So the Rev. T. W. Fowle, after remarking that as yet "evolution is a matter of faith rather than of knowledge," immediately adds, "We confine ourselves to the bare [barren?] assertion that there was a time when the ancestors of our race had no further consciousness of self than is now possessed by an intelligent dog" (*The Nineteenth Century*, March, 1879, p. 390). Similarly Ludwig Noire asserts, "There was a time when man, or, at least, the thought of man, knew neither man nor wife nor child, neither sun nor moon, no beast, no tree, no I nor thou, no here nor there" (*Max Müller and the Philosophy of Language*, 100). Such assertions, in the absence of evidence, are of course valueless.

of progression, taken in its unqualified form, seems to me untenable also. It is quite possible, and, I believe, highly probable, that *retrogression has been as frequent as progression.*"*

The tendency of man to adore, worship, or reverence, with varying degrees of intensity, numerous real or imaginary personages and a great variety of things, has been assumed to have been an original tendency; which is to assert that a trait in the character of the man must have appeared in that of the child; whereas the child, the youth, may have been temperate, the man of mature years may be a hopeless drunkard. In such a case, the youth had not the vice in question, but merely its not-yet or possibility; and so, in the abstract, it may have been with primitive man. But there is a natural principle which may assist us in accounting or partially accounting for his polytheistic reveries, and this is the Law of Reduplication. Primitive man observed a constant repetition and reduplication in nature; dawn followed dawn, sun succeeded sun, day after day; he looked upon his fellow-man, and saw himself again, and learnt that two was one repeated. He would further notice that this repetition was exact or differentiated, e.g., new but similar combinations of clouds; or, again, woman, i.e., mother-man. And all reduplication was connected with intensity of continuance, of being, of wish, of effort. Thus it took the form of;—

1. ἐμφασις, i.e., something appearing in or on a body which was not previously there, an indirect species of reduplication, e.g., ḥ became ḥ. And this principle is thus in constant antagonism with the Law of Least Effort, so closely connected with Phonetic Decay.

2. Direct phonetic and linguistic repetition. E.g., the Malay *raja-raja*, "princess," and *orang-orang*, "people"; the Akkadian *khar-khar*, "hollows," *gal-gal*, "very great" (i.e., great + great); the Dayak *kaká-kakú*, "to go on laughing loud"; the Tamil *muru-muru*, "to mur-mur."† The Akkadian, both in sound and in pictorial delineation, supplies numerous instances of this principle.‡

3. Pictorial Reduplication. The Assyrio-Akkadian ideo-

* *Sociology*, 106. It is to be observed also that very many modern examinations of the belief, etc., of savages, are palpably superficial, incomplete, or contradictory.

† *Apud Prof. Sayce, Principles of Comparative Philology*, 277. Mr. Sayce gives various examples of the principle, e.g., "the reduplicated Aryan perfect," the formation of the plural in the language of the Bushmen, etc.

‡ E.g. *taltal* (the god Hea), *mukmuk-nabi* (altar of incense, i.e. building, *muk*, + building, intensive for the special building), *merner* (the air-god Rimmon).

graphs are very frequently constructed upon this principle, beginning, of course, with the sign for "two, twice."* Thus *ana-essecu* ("God-three-times," Triune God?)=star+star+star.

4. *Purely Mental Reduplication*.—And this applied to (1) personages, (2) general ideas, and (3) their embodiment in tales and legends. Thus, e.g., the one solar power became almost infinitely divided, and the story of the sun and the dawn is told and retold with innumerable variations. M. Bergaigne has attempted in the treatment of the Vedic portion of this branch of the subject to establish a "law of mythic numbers"; and whether his particular solution be accepted or not, sooner or later a general principle underlying them will, doubtless, be detected.

20. *The Illustration of the Metaphysical through the Physical.*

The last principle which I can here notice, and one which has been copiously illustrated in the present paper, is the Law of the Illustration of the Metaphysical through the Physical; that is to say, that the human mind employed physical phenomena in working out those ideas which we now call metaphysical. This principle must be carefully distinguished from the theory of the evolution of the metaphysical from the physical, which with it has no affinity. Just as Pindar tells that Zeus possessed something which the other gods had not,† so man possessed something,—call it α ,—which the other animals had not; and which showed itself in the capacity for entertaining abstract ideas, in language, and in religion. There is not the slightest evidence that any other animal possesses even the not-yet of any of these capabilities or qualities; and hence the difference between them and man may well be said to be in kind and not in degree. But this α possessed by man contained the non-yet of metaphysics or "the things which come after physics"; ‡ and when applied by him to the physical world produced purely metaphysical ideas, e.g.:—

* Vide e.g., the following numbers in Prof. Sayce's *Cuneiform Syllabary*, 4a, 16, 17, 39a, 107a, 137, 140, 165, 166, 168, 169, 188, 197, 198, 212a, 281, 311, 314, 356, 358, 382, 438, 481.

† Vide Bunsen, *God in History*, ii. 149; Prof. Max Müller, *Lectures on the Science of Language*, ii. 484.

‡ "The name 'Metaphysics' is a mere title signifying 'the things which follow after physics'—a title given by Aristotle's school to a mass of papers which they edited after his death," and which "were composed after the physical treatises" (Sir Alexander Grant, *Aristotle*, 160).

To be is primarily to grow (cf. Sanskrit root *bhū*).*

He is signifies primarily he breathes (cf. Sanskrit root *as*).*

The soul and spirit, *saivala* (Gothic), ghost, *geist*, gust, *spiritus, animus, anima, pneuma, thymos*, etc., are air in motion or agitated (cf. Greek *seio*, and Sanskrit root *dhu*, to shake).

Time, i.e., the partition of period, is originally identical with eternity (Sanskrit root *ay*, to go; Sanskrit, *aýus*; Greek, *aíos, aiei, aión*; Latin, *aevum, aevitas, aetas, aeviternus, aeternus, aetaticum*; Etruscan, *aiv-il*; French, *aé, edage, âge*; Gothic, *aivs, aiv, niaiv*; Modern German, *je, nie*; English, *age, ever, never, eternal, everlasting*); † and is primarily the flow and re-flow of solar, lunar, and sidereal light in space,‡ i.e., existing extension, substantial and non-substantial. So dies=*lux*. No light, no time.§ Thus we say that time, the real solar-phoenix, flies.

These are, of course, Aryan instances, but non-Aryan languages will supply similar results. Thus through the visible-external was coined the purely mental; the former clothed the latter, as the body does the soul. But to assume, e.g., that because man connected evil in his mental picture with darkness or chaos, therefore darkness or chaos was his only idea of evil, would be altogether unwarrantable.|| The poet calls Ingratitude a "marble-hearted fiend," and on such a principle we might as well suppose that the ungrateful were originally regarded as having literally marble hearts. The use by man of the physical to assist him in the expression of the metaphysical, no more proves that the germ of the latter is contained in the former, than the use of an axe to cut a stick proves that the germ of the stick is the axe.

To conclude: I have endeavoured in the present paper, which, in method and general line of argument, is a continuation of my former one, to analyze the religion and mythology of the Aryans of Northern Europe; and, in so doing, to illustrate the true position occupied by the physical in archaic thought; to call attention to some important consequences which result from the Primitive Aryan unity; and particularly to notice the

* Vide Appendix A.

† Vide *Lectures on the Science of Language*, ii. 274.

‡ I have recently illustrated this in a lecture delivered before the Hull Philosophical Society, and entitled *The Hall of Seb: an archaic study of Time*.

§ "That which is before the sun is no-time" (*Maitri Upanishad*, vi. 14, apud Muir, *Sanskrit Texts*, v. 410. The writer declares that the sun is the source of time—*suryo yonih kalasya*. Cf. *Genesis*, i. 14).

|| For some excellent remarks in illustration of this point, vide M. Lenormant, *The First Sin* (in *The Contemporary Review*, Sept., 1877, p. 162).

great importance of the linguistic aspect of the subject; and, lastly, to indicate several grand unities which run throughout existence, and several harmonious principles which supply illustration and explanation of physical and mental phenomena. However we may differ from our ancestors we shall do well to believe with them that we are all children of the one great Father, who has reserved for them that love and obey Him a glorious future, such as appeared through a glass dimly to the poet-prophet Pindar, when he exclaimed,—

“Pious spirits, tenanting the sky,
Chant praises to the Mighty One on high.” *

THE RELIGION AND MYTHOLOGY OF THE ARYANS OF NORTHERN EUROPE.

Synopsis.

1. The Aryan Race in the Holoethnic Period.
2. Modern Investigation into Aryan and Proto-Aryan Speech.
3. The Rise of Mythology.
4. Certain Primary Unities.
5. The Argument from General Consent.
6. The Wends, their several Divisions and Religious Belief.
7. The Teutons, and their several Divisions.—German Religious Belief.
8. Scandinavian Sacred Literature.
9. The Norse Divinities.
10. Analysis of the Norse Divinities.
11. The Norse Kosmogony.
12. The Opponents of the Gods.
13. Analysis of the Opponents of the Gods.
14. The Law of Kosmic Order.
15. Ragnarok.
16. Beliefs respecting the End of the World.
17. The Regeneration.
18. Odhinn and the Supreme Aryan God.
19. The Law of Reduplication.
20. The Illustration of the Metaphysical through the Physical.

APPENDIX A.

Illustrations of the Primitive Unity of the Aryan Language.

APPENDIX B.

Primary Roots of Proto-Aryan according to Fick (the “alpha speech”).

* Εὐσεβίων δ' ἐπονράντοις ναιοῖσας
Μολπαῖς μάκαρα μῆγαν ἀείδοντ' ἐν ὅμνοις (*Threnoi*, Frag. iii.).

APPENDIX C.

Some Points of Contact between the Norse Kosmogony and other Aryan Myths.

APPENDIX D.

The Etruscans.

APPENDICES.**APPENDIX A.—Page 4.****ILLUSTRATIONS OF THE PRIMITIVE UNITY OF THE ARYAN LANGUAGE.**

The Substantive Verb :—Sk. *asmi, asti, asti*; Zend, *ahmi, ahi, asti*; Gk. *eimi, esti, esti*; Lat. *sum, es, est*; Lith. *esmi, esci, esti*; Goth. *im, is, ist*; Eng. *am, art, is*. Roots :—Sk. *as*, “to breathe,” Eng. *is*; Sk. *bhu*, “to grow,” Gk. *phu-o*, Eng. *be*; Sk. *vas*, “to dwell,” Eng. *was*.

Father :—Sk. *pitar*, Zend, *patar*, Gk. *pater*, Lat. *pater*, Goth. *fadur*, Eng. (temp. Wiclf) *fadir*, Irish *athair*.

Mother :—Sk. *matar*, Zend, *matar*, Gk. *mētēr*, Lat. *mater*, Slav. *mati*, Irish *mathair*.

Daughter :—Sk. *duhitar*, Zend, *dughdhar*, Gk. *thugatēr*, Goth. *dauhtar*, Irish *dear*.

House :—Sk. *dama*, Zend, *demana*, Gk. *domos*, Lat. *domus*, Slav. *domu*.

Horse :—Sk. *asva*, Zend, *aspā*, Gk. *hippos*, Lat. *equus*.

Cow :—Sk. *go, gaus*, Gk. *bous*, Lat. *bos*, Old Germ. *chuo*, Mod. Germ. *kuh*, Eng. *cow*.

Dog :—Sk. *stan*, Zend, *span*, Gk. *ku-ōn*, Lat. *can-is*, Goth. *hun-ds*, Eng. *hound*.

Sow :—Sk. *su*, Gk. *hus*, Lat. *sus*, Eng. *sow*.

Mouse :—Sk. *mūsh*, Gk. and Lat. *mus*, Old Germ. *mūs*, Eng. *mouse* (i.e., “thief”).

Yoke :—Sk. *yugam*, Gk. *zugon*, Lat. *jugum*.

Smoke :—Sk. *dhumas*, Gk. *thumos*, Lat. *fumus*, Old Germ. *daum*, Eng. *fume*.

Ship :—Sk. and Gk. *nauis*, Lat. *navis*.

Two :—Sk. *dvi*, Zend, *dva*, Gk. *duo*, Lat. *duo*, Slav. *dva*.

Cardinal numbers in Zend :—*æva* (Sk. *eka*), *dva* (vide sup.), *thri* (Sk. *tri*, Gk. and Lat. *treis*, Goth. *thri*, Slav. *tri*), *cathwar* (Lat. *quatuor*), *pancan* (Lat. *quinque*), *kshvas* (Sk. *shash*, Gk. *hex*, Lat. *sex*, Eng. *sexx, six*), *haptan*, *astan*, *navan*, *dasan* (Sk. *dasa*, Gk. *deka*, Lat. *decem*), *aeva-dasan* (i.e. 1 + 10, Sk. *ekadasa*), etc.

APPENDIX B.—Page 5.**PRIMARY ROOTS OF PROTO-ARYAN (According to Fick. “Alpha speech”).****I. Roots formed from a vowel.**

a, to breathe; *i* (*ja*), to go, press; *u* (*va*), (1) to cry, etc. (2) to twist; *u* (*av*), to be content, to be fond of, help, etc.

II. Roots formed from *A* and a consonant.

ak (three meanings), to reach, see, bend ; *ag* (two meanings), to push, smear, etc. ; *agh*, to desire, speak ; *ad*, to eat ; *ap*, to reach ; *ab*, to resound, swell ; *am*, to hurt ; *ar* (four meanings), to go, disjoin, shine, utter sound as, to throw.

III. Roots formed from a consonant and *A*.

ka (five meanings), to reach, lend, utter, sound, desire, burn ; *ga* (three meanings), to push, be clear, utter sound ; *gha* (three meanings), to gape, utter sound, strike ; *ta*, to stretch ; *da* (four meanings), to give, look, bind, move ; *dha*, to place, stream ; *na* (three meanings), to bend, bind, cry ; *pa* (four meanings), to reach, touch, swell, pant ; *ba*, denotes a sound ; *bha*, to appear, strike ; *ma* (six meanings), to diminish, exchange, measure, gush forth, remain, roar ; *ra*, to abide, love ; *va*, to blow, push, wet ; *sa*, to let go.

IV. Roots formed from a double consonant and *A*.

kva, to swell, burn ; *ska* (five meanings), to move, cover, glow, rest, cleave ; *sta* (three meanings), to utter a sound, hide, stand, *sna*, to wash, swim ; *spa*, to draw, have space ; *sva*, to utter a sound.

APPENDIX C.—Page 27.

SOME POINTS OF CONTACT BETWEEN THE NORSE KOSMOGONY AND
OTHER ARYAN MYTHS.

1. *The Cow Audhumbla.*

In the Baktrio-Iranian system a primeval cow, ox, or bull, existed prior to the present state of things, and was slain for the good of the world and in furtherance of cosmic order (vide *Zoroaster*, sec. 8 ; Haug, *Essays on the Parsis*, 147 ; Bleek, *Avesta*, ii. 29). In India imagery very similar to the Norse had probably, in a climate entirely different, quite another significance, and the cow of abundance is sometimes the cloud whose rain is milk, and perhaps at times the dawn which nourishes the young sun (vide Gubernatis, *Zoological Mythology*, i. 224 ; cf. also Darmesteter, *Ormazd et Ahriman*, 159, 191). So Carlyle remarked long ago, "The cow Adumbla, licking the rime from the rocks, has a kind of Hindoo look. A Hindoo cow, transported into frosty countries. These things will have a kindred with the remotest lands, with the earliest times. Thought does not die, but only is changed" (*Lectures on Heroes*, i.).

2. *The Four Dwarf-Guardians.*

The nations of antiquity generally divided the horizon into four regions (cf. Job, xxiii. 8, 9), east (before), west (behind), north (left), and south (right). Hindu mythology has placed an elephant in each of "the four ends of the world," but the dwarf myth is the older of the two. The protection of a house, the *door*, has preserved its primitive name in most of the Aryan dialects, Sk. *dvar*, Gk. *thura*, Lat. *fores*, Old Germ. *tor*, Slav. *dver-i*, and hence Sk. *dvarika*, "door-keeper"; Ang.-Sax. *dverg*, Eng. *dwarf*, a word which acquired its present sense "when that office was assigned to those whose bodily defects disqualified them from hunting or war" (Rev. D. H. Haigh, *Yorkshire Dials*, in *The Yorkshire Archaeological and Topographical*

Journal, v. 165. Mr. Haigh's article is a very fine study). Obscure general ideas, kosmogonical and otherwise, will frequently become luminous when illustrated by original manners and customs often their material counterparts.

3. *Askr, the First Man.*

Grimm identifies Isco, the second son of Mannus, with Askr ; and Alcuin, A.D. 735—804, "still uses the expression, son of the ash-tree, as synonymous with man" (Prof. Max Müller, *Lectures on the Science of Language*, ii. 503). According to Hesiod, "the men of the third or brazen age had sprung from the ash-tree ; that is to say, they were giants who had descended from the wood-crowned hills, with brazen weapons and spears of ash-wood" (Bunsen, *God in History*, ii. 24). In the Norse kosmogony "the earth brings forth the first pair of human beings as man and wife, under the likeness of the hard ash-tree and the soft alder. The gods endow them with intelligence and strength, and deliver them from the giants, or destructive agencies of nature" (*Ibid.* 407). Cf. Homer, "Thou art not sprung of oak or rock, whereof old tales tell" (*Od.* xix. 163, *apud* Butcher and Lang). So Virgil speaks of "gensque virum truncis et duro robore nata" (*Aen.*, viii. 315). The kosmos is an ash-tree, Yggdrasil ; and men are its children.

4. "The Gods who possess the Wide Heaven."

The bright divinities of Asaheim and Vanaheim, occupants of the ethereal and aerial expanse (vide *sup. secas.* 9, 10), exactly correspond with the Homeric "gods who possess the wide heaven," a standing formula (vide *Ilias*, xx. 299 ; *Od.* i. 67 ; iv. 378 ; v. 169 ; vi. 150, etc.). expressive of the light-powers ; Zeus, the "Bright," Hérē, the "Gleaming," Athene, the "Dawn," Artemis, the "Pure-and-sound-one," Apollo, and others ; and light physical is inseparably connected in idea with light mental, so that Athene is the wisdom of Zeus, and Apollo the manifested splendour of his will exhibited in harmonious action. Precisely similar are the Indian possessors of the bright heaven, the inhabitants of the Vedic Asaheim (vide *Zoroaster*, c. 19, etc.). Bunsen well observes that the earlier Eddaic lays "constantly betray a reference to the climate of Central Asia" (*God in History*, ii. 494).

5. *The Ocean Stream and Under-world.*

The Norse view of the earth as surrounded by the ocean-stream, is exactly in accordance with the Homeric ; and the concept of Helheim and Niflheim in many respects resembles the Homeric Under-world, except that, in accordance with a northern climate, in the Norse Under-world, cold is a prominent evil, whilst naturally it is not a feature in the Greek myth, which also, moulded by a more refined taste, is free from those bizarre symbolical representations that harmonize with the genius of India and Scandinavia, and also of many non-Aryan nations. The hell-hound Garmr, the "Swallower," the Vedic Sarvari, "Darkness-of-night," the Greek Kerberos, and whose earliest appearance is in a dual form, as the two dogs of Yama, is a prominent feature in both the Greek and the Norse myth. The dog-myth is exceedingly interesting and instructive ; the animal was held in the highest esteem by the Eastern Aryans, both Indic and Iranic, and the Yama-dogs, guardians of the ways from and to the Under-world (a dog being the natural symbol of a way-guardian) were at first dogs-of-light, friendly to the good. They gradually became more awful and strange in form, being "four-eyed" (i.e., the flow of light to the four quarters), and at length sinking with the sun to the Under-world, they change into a dog or dogs of

darkness and monsters, like the Greek Orthros (the Vedic *Vritra*), a two-headed dog (*i.e.*, the two dogs in one) slain by the solar Herakles in the western island of Erythia, the "Reddish." The comparative student will also remember the Assyrian Under-world in this connection (vide *The Descent of Ishtar*, in *Trans. Soc. Bib. Archæol.* iii. 118, *et seq.*).

APPENDIX D.—Page 40.

THE ETRUSCANS.

The ethnological position of the Etruscans is yet undetermined. It is admitted on all sides that the labours of Donaldson, the Earl of Crawford, and Professor Corssen (to say nothing of Sir William Betham and other earlier investigators) have been in vain. Corssen, especially, from whom so much was expected, has failed utterly (vide the criticisms by Aufrecht and Deecke upon his *Über die Sprache der Etrusker*, and some amusing remarks upon the same work by Mr. Robert Ellis, *Peruvia Scythica*, 170). Professor Sayce, notwithstanding the efforts of the Rev. Isaac Taylor (*Etruscan Researches*; vide also a very able paper, *On the Etruscan Language* read by Mr. Taylor before this Society in 1876), regards Etruscan as *sui generis*, but admittedly non-Aryan. I incline strongly towards Mr. Taylor's view that it is a Turanian language of the Altaic type, and hence remotely connected with the Akkadian (vide Lenormant, *Chaldean Magic*, 299 *et seq.*). It is to be observed that the words (admittedly numerals, cf. Sayce, *Principles of Comparative Philology*, second edition, 69) upon the celebrated dice of Toscanella, whatever else they may be, are also Akkadian terms,—*Mach* (one), "supreme" (vide *Zoroaster*, sec. 2); *Ci* (two), "the earth" (cf. the goddess *Nin-ki-gal*). "Great-lady-of-the-Earth," also called *Dav-cina*, "Ruler-below," the Greek *Dauke*); *Zal* (three), "the sun" (Assyrian *Samsu*); *Sa* (four), "blue, the firmament" (stretching to the four quarters, vide Appendix C.); *Thu* (five) would = *Ak. Tu* ("the Etruscan *th* being equivalent to *t* or *d*," Taylor, *Etruscan Researches*, 163), "the god of death" (Professor Sayce in *Trans. Soc. Bib. Archæol.* iii. 165), primarily the evening sun (cf. *Zoroaster*, sec. 24, *Yama*), called by the Law of Reduplication (vide sec. 19) *Tutu*. So *Ubara-tutu*, "the-glow-of-sunset," is the sire of *Tamzi* (the Syrian *Tamuz*), "the-sun-of-life" or morning sun. Again, the sun when below the horizon is called *Utuci* (vide Prof. Sayce, *Assyrian Grammar*, Syllabary, No. 14), *i.e.*, *utu* ("sun") + *ci* ("earth, lower"). Cf. *Ak. tu*, *tuv*, *tum*, "fear"; *tum*, "to bring down"; *tuv*, *tum*, "to produce, to create, obscurity"; and the Egyptian *Tum*, the divinity of the setting-sun and darkness, called "the sun who reclines himself"; and also styled *Atum* (cf. the Kamic *a*, "old," the *Ak. at*, "father"). *Huth* (six) = *Ak. Ud*, "sun, day, to rise, light." *Ud*, *ut*, seems to be primarily the morning sun (perhaps *U*, primarily sun-word, and *du*, "front," *i.e.*, east); the reverse is certainly the evening-sun. Taking these six words on the dice, the three couples placed opposite each other are *Mach-Zal* (God—the Sun-god), *Ci-Sa* (Earth-Heaven), and *Thu-Huth* (Darkness-Light). God, as revealed in the Sun-god, reveals the two opposites, Earth and Heaven, by the succession of the two opposite principles, Darkness and Light. But there is another set of six mysterious words which compare very remarkably with the foregoing, namely, the words said to be in an unknown tongue engraven on the waist and feet of the great statue of Ephesia-Polymastos, a divinity early confused by the Greeks with their own purely Aryan Artemis. These words are given by Hesychios (in voc. *Ephesia Grammata*) as *Asktion*, *Kataskion*, *Lix*.

(Aix ?), Tetrax, Damnameneus, and Aision ; and formed the famous Ephesian Letters or Spells (vide Plutarch, *Sympos.* vii. 5 ; Suidas, in voc. *Ephesia Grammata* ; cf. Acts, xix. 19). Whether the inscription on the image was bilingual, or whether the foregoing words are an attempted translation of originals, does not positively appear. Androkydes the Pythagorean "said that *askion* (shadowless) meant darkness, for it has no shadow ; and *kataiskion* (shadowy) light, since it casts with its rays the shadow, and *lîx* is the earth, according to an ancient appellation ; and *tetras* [*i.e.* the number 4] is the year, in reference to the seasons [rather, I think, the heaven in reference to the four quarters] : and *damnameneus* [a word which has been found on Gnostic amulets] is the sun ; and *ta aisia* [a variant reading of *aision*] is the True Voice. And the symbol intimates that divine things have been arranged in harmonious order,—darkness to light, etc." (Clemens Alex. *Stromata*, v. 8. ; vide my *Great Dionysiak Myth*, ii. 131, *et seq.* ; King, *The Gnostics and their Remains*, 94, note). Here, again, we find six words with the remarkable meanings Truth (=God, One, Supreme), and the Sun, Darkness and Light, Earth and Heaven. The year, or period of four seasons, which is a purely mental concept, is out of place in this list of great external phenomena. The subject is one of much interest, but this is not the place in which to continue the investigation further.

Mr. William Edward Hearn, in his interesting work, *The Aryan Household*, 1879, attempts to show that reverence for ancestors and the common-weal were the foundations of the religious cult ; and with him the "house spirit," and the Lares and Manes come prominently to the front. But as he entirely ignores the Etruscan (non-Aryan) element in Roman belief, his proofs and instances do not really much affect the question of the primitive religion of archaic Aryan man. Mr. Hearn would fain supply even the word "Lar" with an Aryan derivation, observing "What we want is an instance of a Sanskrit word commencing with *n* that is represented by a Latin word commencing with *l*" (page 287, note). This, however, is not forthcoming ; and there is no reasonable doubt that "Lar" and "Manes" are non-Aryan words, and also to a great extent non-Aryan ideas. Mantus and Mania are the Latin forms of the names of the Etruscan king and queen of the Under-world, and whilst any dogmatism on so obscure a subject would be altogether unwarrantable, I cannot but remark that in Akkadian *Man tu*= "King-of-Darkness," and *Ma-na* "Land-of-eclipse." Mr. Taylor has already observed that *ma* is "land" alike in Etruscan and Akkadian. After some statements (which seem to me to be highly doubtful) respecting the religious belief of archaic Aryan man, Mr. Hearn quietly remarks (p. 21), "It is not easy to give strict *proof of propositions* which are not so much expressly stated by any early writer as implied and assumed throughout *all* ancient literature" (! !) Thus, whilst these mysterious "propositions" cannot be proved, we must *assume* that everyone else has always assumed them ! The *Rig-Veda* does not countenance these views, but this awkward fact is explained by a reference to a statement in a work long subsequent that these hymns relate "to the worship of the gods [only]" other matters being, we are again to assume, purposely omitted.

Mr. George Dennis (*Cities and Cemeteries of Etruria*, edit. 1878, vol. i. p. 355) gives an unique representation from a tomb at Tarquinii of the heroes Theseus and Peirithoös with the demon Tuchulcha in the Under-world, where, according to the legend, they had descended in a wild attempt to carry off Persephone, the bride of the King of Hades (vide Horace, *Carmina*, III. iv. 80). "The hideous and malignant demon, who bears the novel name of *Tuchulcha*, has asses' ears, two hissing snakes bound round his brows and mingling with his shaggy locks," and "an enormous eagle's beak, which

serves at once for nose and mouth, wide open. He appears to be seizing Pirithous by the neck with one hand, while with the other he brandishes a huge black and blue serpent over the head of Theseus" (*Cities and Cemeteries of Etruria*, i. 353). He has also "open wings." Any explanation of the name "tuchulcha" (= *tu-kul-ka*) will, I feel sure, be sought for in vain amongst Aryan dialects; but when we turn to the language of Akkad, the whole occult representation at once becomes luminous. *Tu* (vide p. 52) = (1) The setting-sun, and hence (2) Darkness (*Erebos*, vide *Zoroaster*, p. 17, note 2). *Kul* (vide Prof. Sayce, *Assyrian Grammar*, Syllabary, No. 375) is "to destroy" (cf. the Etruscan, *Kul-mu*, the Turkish *Ghoul*, etc.). *Ka* or *ca* is "mouth" (*As. Gram.*, Syllabary, No. 39). The cuneiform combination is the ideograph of a mouth. Vide Geo. Smith, *Phonetic Values of the Cuneiform Characters*, 5). Tuchulcha would therefore signify in Akkadian the "Destroying-mouth-of-Darkness," represented by the Manducus-figure (vide *sup. p. 29*, note 4), "the jaws of vacant darkness" (Tennyson, *In Memoriam*, xxxiv.), into which the luckless heroes have fallen, and is thus a variant phrase of the wolf Fenrir and the dog Garmr; but the general idea is naturally the common property of both Aryan and Turanian. Tuchulcha, like night, "embraces with dusky wings."

The eagle's beak is a peculiar feature, and one which reminds us of the eagle-headed being (formerly called Nisroch, vide 2 Kings, xix. 37). The LXX. read variously, Asarach, Nasarach, or Mesorach) who appears on the sculptures at Nimrud, holding the mystic pine-cone (vide *The Great Dionysiak Myth*, Vol. II. cap. viii., sec. 2. In voc. *Cone* and *Pine*). But there was also an archaic Chaldeo-Akkadian legend respecting a wicked being, apparently one of the inferior gods, called *Zu* (vide Geo. Smith, *Chaldean Account of Genesis*, cap. vii. The Sin of the God *Zu*; Lenormant, *Chaldean Magic*, 171, note 6), who was connected with or transformed into a terrible bird called the *Zu*-bird. This creature is described as a sharp-beaked, flesh-eating, quick-darting, lion, giant, cloud, and storm-bird (vide Delitzsch, *Assyrische Studien*, 96); and in the myth the actual habits of some "ravenous bird" (Isaiah, xlvi. 11, where the expression is used symbolically) of the country are evidently applied to natural phenomena. The cloud-and-storm bird is the upper or aerial darkness, in fact a variant phase of the giantess Angurbodha (vide *sup. p. 27*); and the gloom which falls from above (cf. Homer, *Od.*, v. 294: "Night started from heaven"), sinks to the Under-world, where it is personified as Fenrir or Tuchulcha. The sharp beak and quick darting probably refer to the lightning. In addition, however, to the foregoing line of thought, it is quite possible that in the mysterious history of the god *Zu*, his bird the eagle, and his insults to and quarrel with the divinities of the Chaldeo-Akkadian Pantheon may, as I have already elsewhere (*The Great Dionysiak Myth*, ii. 257, note 3) suggested, be dimly portrayed—some archaic religious dispute between Aryan, Turanian, and Semite, between the followers of Zeus-Dyaus and of Bel, such a schism as that which subsequently broke out between Indian and Iranian (vide *Zoroaster*, pp. 15, 17, 60). The wars and discords between different bodies of religionists are frequently described in legend as the contests of their respective divinities. (For numerous illustrations of this principle, vide *The Great Dionysiak Myth*, cap. x.)

The CHAIRMAN.—I have to return the thanks of the meeting to Mr. Brown for his very interesting paper. It is now open for any member to make remarks thereon.

Mr. J. E. HOWARD, F.R.S.—I am sure we are all very much indebted to the author of this learned and admirable paper. As far as I am qualified to appreciate it, I consider it to be a great addition to our knowledge on the subject. I could, however, have wished, in reference to the original belief of the Aryan race, that the writer had referred to some passages in the R̄ig-Veda, which express in admirable language exactly the same truths which we find stated on p. 323 of the paper.

Mr. D. HOWARD.—The subject of Mr. Brown's paper is one of special interest to us all; because, after all, it is to the Teutonic branch of the Aryan race that we owe our origin, and it is interesting to find that the Aryan mythology has preserved a state of comparative purity. There can be no doubt that the power of the Teutonic races against the Roman Empire was owing to the comparative strength of their religious belief; for, poor as it was, it was comparatively valid as contrasted with the utter degradation of the Roman belief. If we compare the state to which religion had fallen among the Romans with that of our Teutonic ancestors at the time when the Eddas were written, it will at once be admitted that, although the religion of our forefathers was crude and barbarous beyond description, especially from our modern point of view, there was a magnificent force about it, as shown in the worship of Thor and Odin, which was great when contrasted with the no-belief of the Greeks and Romans; for, low as those forefathers of ours had fallen, when we compare their later belief with the original faith, they still occupied a higher position than the people of Greece and Rome. I may also say that I think the Mahomedan invasion is a just exemplification of the immense power of an imperfect over an utterly fallen, or no-belief. (Hear, hear.) I think, therefore, that the study of such a subject is one of peculiar interest. There is another thing which, I think, rather illustrates one point connected with this subject, and that is the practical difficulty which has confronted many of our missionaries—a difficulty on which one hears a good many opinions expressed—of knowing what to call God in a heathen nation. The mere philologist runs the risk of making exactly the same mistake as he might have made in regard to the two branches of the Germanic race in Europe—he might call God by the wrong name, he might use a word which means, as Deva does, either god or devil, just as "Deus" and "Dēuce" are identically the same word, and just as the Sclavonic "Bogu" is our "Boȝey." And this points to another curious thing. The Greeks and Romans assumed the identity of the persons they worshipped—they assumed that Zeus was Jupiter, that Heracles was Hercules, that Hermes was Mercurius, and so forth; so that we have been brought up to confuse them entirely, and to believe that the religion of the Greeks and the Romans was the same. There must have been some origin for this identification, and I believe that it arose from the

fact that the Greeks and Romans were sound philologists. Being nearer the fountain-head, they recognised the identity of two false gods, or, rather, of the false worship or the degeneracy from true worship; and it is curious to find how completely in Christian times, in the north of Europe, we have assumed an opposite identity, and take almost every one of the names of the Norse gods as a name for the devil. There is not a familiar or vulgar name for the devil that is not derived from the Norse mythology,—even the very undignified name of "Scratch" is actually derived from "Scratti"; and of course our words "Bogey" and "Deuce" are equally derived from our old heathen forefathers' names for gods. By a very natural inversion of the old Roman process, the Christians assumed that the gods of their forefathers were actual personal devils, and even the popular idea of appearance of the devil is undoubtedly derived from Pan, or some northern variation of Pan—some wood-god—for certainly nowhere else can we find the familiar representation of the author of evil, which I believe is so firmly impressed on the minds of many people that they would consider any doubt about it as an absolute disbelief in the Bible. It is curious that to this day, the old traditions have remained, and still affect popular ideas, and we can trace these myths in the old nursery tales, and it is singular to find that these nursery tales contain, after all, some of the oldest of our learning—how old one does not know, but certainly extending over a very large number of the twelve hundred years the Etruscans would have traced back our history. (Applause.)

Mr. J. H. BUCKLEY.—I should like to ask what it is that Mr. Herbert Spencer means when he says, "While the degradation theory, as currently held, is untenable." What is the degradation theory to which he alludes?

Mr. BROWN.—I believe the theory to which Mr. Herbert Spencer alludes is that mankind started with a completely formulated creed given to them by directly Divine revelation, and that they worked down to the condition in which we find the modern savage.

Mr. J. H. BUCKLEY.—Somewhat analogous to the Biblical theory.

Mr. BROWN.—Somewhat. It is Mr. Herbert Spencer's statement that it is untenable—not mine. He would probably repudiate all that we call the supernatural.

Mr. J. H. BUCKLEY.—Precisely.

Mr. BROWN.—It only remains for me to thank the members of this Institute for the very kind attention they have given to my Paper on a subject which, although exceedingly interesting and important, is undoubtedly severe. Perhaps I may be allowed to make one or two further remarks which, I hope, will interest you. I had the pleasure, only last Friday when coming up to town, of reading the "Hibbert Lectures" for last year—lectures in which "the origin and growth of the Christian religion as illustrated by the religion of ancient Egypt" are treated by M. Renouf, who is an authority on that topic. The publication of those lectures had been delayed, and I was exceedingly gratified on going through

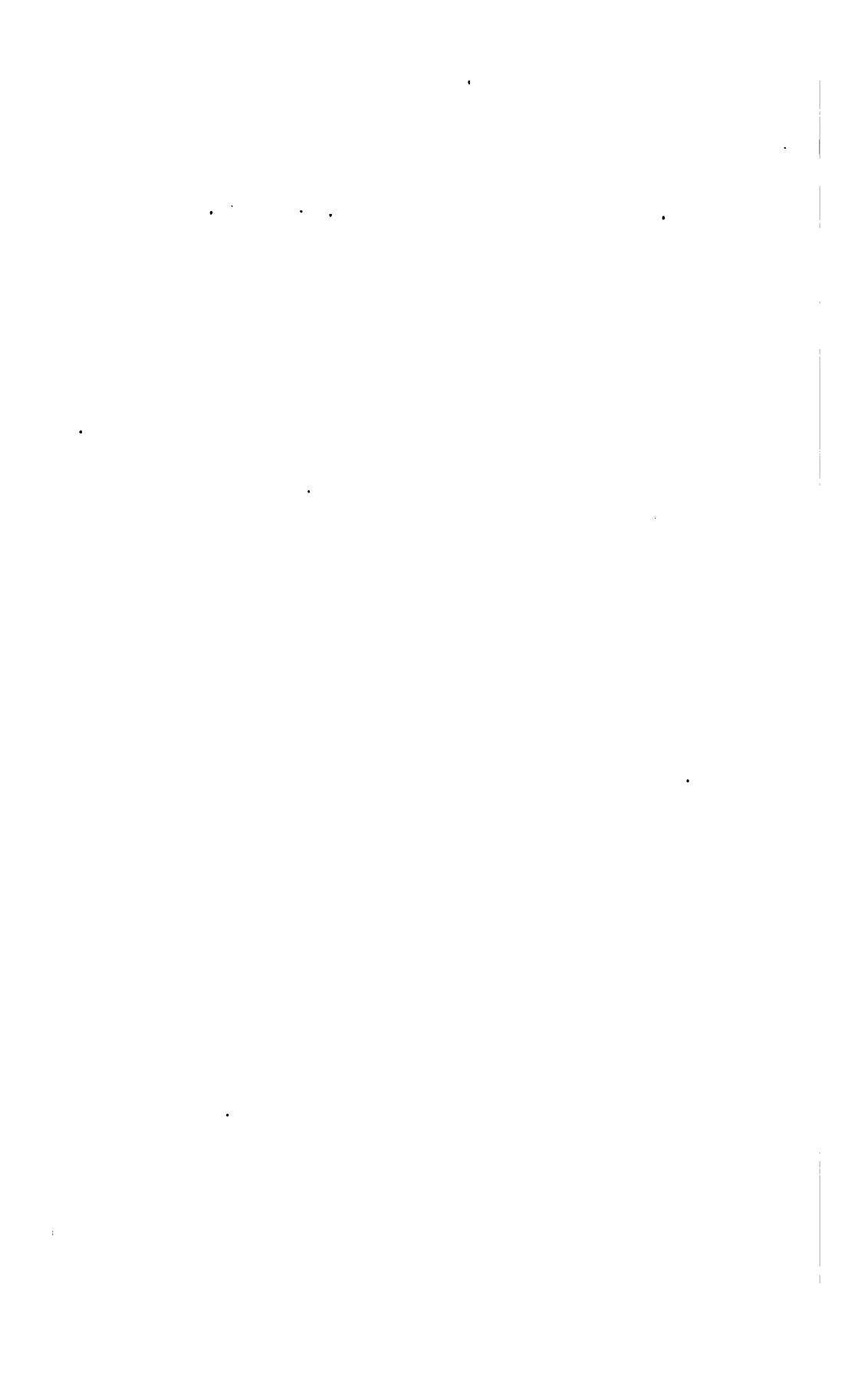
the book to find that M. Renouf's conclusions with regard to Egypt are similar to those to which I have ventured to come with regard to the Aryan family. For instance, I have mentioned the Rita-path as a law of kosmic order. I was not aware when that was written that anything analogous to it had been discovered in Egypt, but I am glad to observe from what I find in M. Renouf's book that the law of kosmic order is as fully laid down in Egypt as ever it was in India. I find on pages 208-9 an allusion to the law called "Maāt," which controls all things, and which is the outcome of some Supreme Being. It is particularly connected with the ordinary phenomena of nature, the setting of the sun, the moon, the stars, and the course of the seasons, while even the various inferior gods are bound by it—that is to say, the personifications of nature act in exact harmony with kosmic law—an idea precisely analogous to that which we find in India; because, as a matter of course, the laws of nature were not found out in a day; that knowledge was the result of long and careful observation, and it must have been a long time before man came to have full confidence in those laws. Another important point which I find in M. Renouf's lectures is the principle of monotheism, or a belief in one God,* which it is one of the great objects of this Institute to set before you. M. Renouf expresses himself with considerable caution on this point, but he quotes translations, many of them perfectly new to us, all which go a long way to prove that during the whole history of ancient Egypt monotheism was the belief, at all events of the more enlightened people, until comparatively late times, when the religion of the Egyptians became purely pantheistic and thoroughly degraded. The author observes, after having quoted what the idea of God is, as given in the words of Dr. Newman:—"I am obliged to acknowledge that single parallel passages to match can be quoted from Egyptian far more easily than either from Greek or from Roman religious literature. . . . Where shall we find a heathen Greek or Latin saying, like that of a papyrus on the staircase of the British Museum: 'The great God, Lord of heaven and of earth, who made all things which are'? Or where shall we find such a prayer in heathen Greek or Roman times as this: 'O my God and Lord, who hast made me and formed me, give me an eye to see, and an ear to hear thy glories'?" That is a very ancient Egyptian prayer. I think I have already mentioned the "self-existent Being," and I may refer you to another passage from an Egyptian text which says: "The Divine Word is made for those who love and for those who hate it; it gives life to the righteous and it gives death to the unjust"—a passage which very forcibly reminds me of that in which the Apostle Paul speaks of "The

* Canon Cook, the editor of the Speaker's Commentary, has informed me that, after a long and careful examination of the question, the result of his researches has been to show that monotheism was existent in the earliest ages, and not pantheism, as some still urge.—ED.

savour of life and death." Again, "in a papyrus at Turin," as M. Renouf tells us, "the following words are put into the mouth of 'the almighty God the self-existent, who made heaven and earth, the waters, the breaths of life, fire, the gods, men, animals, cattle, reptiles, birds, fishes, kings, men, and gods [in accordance with one single thought]. I am the maker of heaven and of the earth. I raise its mountains, and the creatures which are upon it; I make the waters and the mehura comes into being. I am the maker of heaven and of the mysteries of the twofold horizon. It is I who have given to all the gods the soul which is within them. When I open my eyes, there is light; when I close them, there is darkness. I make the hours, and the hours come into existence.' Another text says: 'I am yesterday, I am to-day, I am to-morrow.'" This is almost an exact parallel to the sublime passage in our own book:—"The same yesterday, to-day, and for ever." Another text says, "Watcher, who traverseth the endless ages of eternity. The heaven was yet uncreated, uncreated was the earth, the water flowed not; thou hast put together the earth . . . O, God! architect of the world, thou art without a father, . . . thou art without a mother . . . It is by thine own strength that thou movest . . . Heaven and earth obey the commands which thou hast given . . . O, let us give glory to the God who hath raised up the sky and who causeth his disk to float over the bosom of Nut"—that is to say, the over sea—the expanse above—it means the God who has raised up the sky, and caused the disk to pass across it. The passage proceeds:—"Who hath made all lands and countries, and the great sea in his name of 'Let-the-earth-be!'" You see how this harmonises with the language of Genesis:—"Let there be light." Everything is, according to this, laid down and produced by the omnipotence of the Creator. M. Renouf adds:—"A beautiful hymn (written, it is expressly stated, for the harp) preserved in two MSS., now in the British Museum," . . . in that hymn we read:—"He is not graven in marble, as an image bearing the double crown. He is not beheld; He hath neither ministrant nor offerings; He is not adored in sanctuaries; his abode is not known; no shrine [of his] is found with painted figures. There is no building that can contain Him. . . . Unknown is his name in heaven; He doth not manifest his forms. Vain are all representations." I think it would be hardly possible to use language more simple and beautiful, or more in accordance with our own ideas. (Hear, hear.) I also find in M. Renouf's book some passages as to the degradation of religion, where, after quotations as to the destination of the righteous in earlier times, we come to later times—such as those of Greece and Rome—when the early belief in righteousness and temperance and the judgment to come had died out, and thus we find a lady who had died, represented as addressing her husband from the grave in these words:—"O, my brother, my spouse, cease not to drink and to eat, to drain the cup of joy, to enjoy the love of women, and to make holiday: follow thy desires each day, and let not care enter into thy heart as long as thou livest upon earth. For as to

Amenti" (which means the Hades) "it is the land of heavy slumber and of darkness, an abode of sorrow for those who dwell there. They sleep in their forms; they wake not any more to see their brethren; they recognise not their father and their mother; their heart is indifferent to their wife and children. Every one [on earth] enjoys the water of life, but thirst is by me. The water cometh to him who remaineth on earth, but I thirst for the water which is by me. For as to the god who is here, 'Death-Absolute' is his name. He calleth on all, and all men come to obey him, trembling with fear before him. With him there is no respect for gods or men; by him great ones are little ones. One feareth to pray to him, for he listeneth not." So that, you see, in the last ages of Egypt, the religion of the people had come to this: true belief had died out, and there was nothing in its place but "Let us eat and drink, for to-morrow we die." It is very gratifying to find that so accomplished an authority in the great field of Egyptology finds the same results as those who have been directing their inquiries into the Aryan branch of the human race. In the two cases we find similar myths about day and night, the sun and the dawn, the crocodile of night being said to devour the sun, and so forth; and then, when the original world may be said to have passed away, when the ancient states had given up belief in the old religion, just at the moment when everything seemed to be dying, the splendour of Christianity broke upon the world and restored it. (Applause.)

The meeting was then adjourned.





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K.

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L.

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 Lord Justice of Appeal, 60, *Avenus Road, N.W.*

M.

- F** Maberly, G. Esq. *Victoria House, Elms Park, Rams-*
 gate.
 1868. Macmillan, Rev. Archibald, 45, *Warrington Crescent,*
 Warwick Road, Maida Vale, W.
 1878. MADRAS, THE RIGHT REVEREND THE BISHOP OF,
 Adyar, Madras.
 1871. MARLBOROUGH, HIS GRACE THE DUKE OF,
 K.G. P.C. 10, *St. James's Square, S.W.; Blenheim*
 House, Woodstock, Oxfordshire.
F *+ McARTHUR, ALEXANDER, Esq. M.P. F.R.G.S.
 Raleigh Hall, Brixton Rise, S.W. (VICE-PATRON).
F THE RIGHT HON. THE LORD MAYOR OF LONDON,
 McARTHUR, WILLIAM, Esq. M.P. *Mansion House,*
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 1869. ¶ M'Cann, Rev. James, D.D. F.R.S.L. F.G.S. *London*
 Athenaeum Club, Suffolk Street, Pall Mall East, S.W.;
 8, Oak Villas, Lower Norwood, S.E.
 1878. McCormick, Rev. Canon J. F. D.D. R.D. *Rectory, Geashill,*
 King's County, Ireland.
 1880. McDonald, J. E. Esq. 4, *Chapel Street, Cripplegate,*
 E.C. ; 5, St. John's Park, Blackheath, S.E.

1879. McDonald, the Ven. R. Archdeacon of Mackenzie,
Diocese of Athabasca, Scholar and Hon. Fellow of
St. John's College, Manitoba, *Fort Macpherson,
Mackenzie District, N.W. America, Canada.*
1872. ¶ McDougall, Rev. J. Underleigh, Darwen, Lancashire.
1872. Matthews, John T. Esq. *The Rookery, Shooter's Hill,
Kent.*
1878. MEATH, THE MOST REV. THE LORD PLUNKET, D.D.
BISHOP OF, 12, Earlsfort Terrace, Dublin; *Ard-
braccan House, Navan.*
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1872. Mewburn, William, Esq. jun. 13, *Pall Mall, Manchester.*
- ¶ Milner, Rev. John, B.A. Oxon. Chaplain R.N. *Rectory,
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Queen's Coll. Camb. 45, *Cleveland Square, Hyde
Park, W.; 6, New Square, Lincoln's Inn, W.C.*
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bridge.; 34, Grosvenor Street, W. (VICK-PATRON.)*
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Office, Pall Mall, S.W. (Hon. FOREIGN SECRETARY).*

N.

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- ¶ Niven, Rev. William, B. D. Incumbent of St. Saviour's,
Chelsea, 5, Walton Place, Chelsea, S.W.

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O.

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P.

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1876. Porter, Rev. J. Scott, Professor of Theology and Hebrew. *Dec. 1880.*
1878. Porter, W. H. Esq. J.P. *Ballymacool, Letterkenny.*
- ¶ Prothero, Thomas, Esq. F.S.A. M.R.I. Barrister-at-Law, *Wharncliffe House, 4, St. John's Wood Road, N.W.*

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R.

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S.

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1876. Slater, Josiah, Esq. B.A. *Grahamstown Journal Office, Grahamstown, South Africa.*
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1878. Smith, Major Corry B. *Clairville, Reigate.*
 1875. Smith, Mrs. C. S. *Leeston, South Road, Weston-super-Mare.*
 1873. Smith, Philip Vernon, Esq. M.A. 4, *Stone Buildings, Lincoln's Inn, W.C.*
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 1869. Smith, The Very Rev. R. Payne, D.D. Dean of Canterbury, *The Deanery, Canterbury.*
 1873. Smith, Samuel, Esq. (care of Messrs. Finlay & Co. Liverpool), 4, *Chapel Street, Liverpool.*
 1879. Smith, Samuel, Esq. M.R.C.S.E. L.S.A. Ratcliffe Prize Essay, Queen's Coll. late Govt. Surg.; Sup. Surgeon-Major 1st Ad. Batt. G.E.V. &c. Memb. Bristol Bot. and Microscopical Chal. Soc. *Wyndham House, Kingsdown Parade, Bristol.*
F †Smith, W. Castle, Esq. F.R.G.S. M.R.I. 1, *Gloucester Terrace, Regent's Park, N.W.*
 1870. Smith, Rev. William Saumarez, B.D. Cantab. Fellow of Trin. Coll. Camb. Hon. Canon of Chester, Principal of *St. Aidan's Theological College, Birkenhead.*
 1876. Snowdon-Smith, Rev. R. M.A. Prebendary of Chichester, *Northwold Rectory, Brandon, Norfolk.*
 1876. Souper, Rev. F. A. M.A. Cantab. *The Meads, Eastbourne.*
 1876. ¶Southall, J. C. Esq. A.M. LL.D. 616, *Franklin Street, Richmond, Virginia, U.S.A.*
 1877. Spence, Peter, Esq. *Oldham Road, Manchester.*
 1878. STALEY, THE RIGHT REVEREND T. NETTLESHIP, D.D. late Bishop of Honolulu, formerly Fellow of Queen's College, Camb. *Croxall Rectory, Lichfield.*
F Stalkartt, John, Esq. 5, *Winchelsea Crescent, Dover.*
 1875. Stephenson, Rev. Jacob, B.A. London University, *Southport.*
 1876. Stephenson, Rev. T. Bowman, Principal of the Children's Home, 6, *Church Terrace, Bonner Road, Victoria Park, N.E.*
 1879. Stern, Rev. H. A. 5, *Cambridge Lodge Villas, Mare Street, E.*
 1876. Steuart, D. V. Esq. *The Cedars, Stretford, Manchester* *Albert Chemical Works, Bradford, Manchester.*
 1875. ¶Stewart, Rev. Alex. M.D. LL.D. *Heathcot, near Aberdeen.*
 1873. Stewart, R. Esq. *Ryton Grove, Dorrington, Salop.*
 1879. Stokes, Rev. A. M.A. Camb. Head Master of Mossorie School, *Mossorie, N.W.P. India* (*Publications to W. Tomlin, Esq. 24, Trinity Street, Cambridge.*)

1880. Stokes, Rev. H. Pelham, M.A. Oxon. *Rectory, Wareham, Dorset.*
 1879. Strachan, Rev. J. M. M.D. Edin. *St. Thomas's, Madras; 20, Belsize Square, N.W.*
F Sutherland, The Hon. P. C. M.D. M.R.C.S. Edin. F.R.G.S. Surv.-Gen. *Pietermaritzburg, Natal.*
 1880. Sutton, M. H. Esq. *Cintra Lodge, Whitley, Reading.*

T.

1880. Taylor, Rev. Hugh, M.A. University College, Durham, *Humshaugh, Northumberland.*
 1872. TEIGNMOUTH, THE RIGHT HON. THE LORD, 1, *Athole Crescent, Edinburgh.*
 1879. Thomas, Rev. J. (Cong. Min.), 29, *Queen's Terrace, St. John's Wood, N.W.*
 1876. Thomson, Rev. A. D.D. F.R.S.E. 63, *Northumberland Street, Edinburgh.*
F THORNTON, THE RIGHT REV. SAMUEL, D.D. LORD BISHOP OF BALLARAT, VICTORIA, 29, *Gloucester Street, S.W.; Bishop's House, Ballarat, Victoria.*
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 1875. Thorpe, G. Esq. 20, *Eastcheap, E.C.*
 1872. Townend, Arthur Powell, Esq. *Chislehurst, Kent.*
 1872. Townend, Thomas, Esq., jun. *Chislehurst, Kent.*
 1875. Tristram, Rev. H. B. LL.D. F.R.S. F.L.S. M.Z.S. Canon of Durham, *The College, Durham.*

U.

1880. Usherwood, The Ven. T. E. M.A. Archdeacon of Maritzburg, *Natal, South Africa.*

V.

1880. Vaughan, Rev. David James, M.A. formerly Fell. of Trin. Coll. Camb.; Hon. Canon of Peterborough; Vicar of St. Martin's, Leicester; *St. Martin's Vicarage, Leicester.*
F Vanner, James Englebert, Esq. *Camden Wood, Chislehurst, Kent.*
 1867. Vanner, John, Esq. *Banbury.*
F *Vanner, William, Esq. F.R.M.S. *Camden Wood, Chislehurst, Kent, f.c.*
 1875. †Veasey, H. Esq. M.R.C.S. *Aspley Guise, Woburn.*

1878. VICTORIA, THE RIGHT REV. J. S. BURDON, D.D.
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1872. Vincent, Rev. Osman Parke, M.A. 45, *Seymour Street,*
Portman Square, W.
1872. Vincent, Samuel, Esq. *Mulgrave Road, Sutton, Surrey.*

W.

1876. ¶Wace, Rev. H. M.A. Professor of Ecclesiastical History,
King's College, Lond.; Preacher of Lincoln's Inn,
5, *Mecklenburgh Square, W.C.*
¶F *Waddy, Samuel Danks, Esq. B.A. Q.C. Barrister-
at-Law, 5, *Paper Buildings, Temple, E.C.*
1871. †Walter, John, Esq. M.P. 40, *Upper Grosvenor Street,*
W.; Bearwood, Berkshire.
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Inn, W.C.*
¶F Ware, W. Dyer, Esq. *Redland Hill House, Clifton.*
1880. Watkins, Rev. H. G. M.A. *St. John's Vicarage, Potter's
Bar, Barnet,*
1878. Watson, A. Duff, Esq. 108, *George Street* (Miss Tait's),
Edinburgh (or care of, Messrs. J. Watson & Co. 34,
Fenchurch Street, E.C.).
1877. Watson, W. Livingstone, Esq. 34, *Leadenhall Street, E.C.*
1871. ¶*Weldon, Rev. George Warburton, M.A. M.B. Vicar
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Ovingdon Square, S.W.
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Street, Russell Square, W.C.* (HONORARY TREA-
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desdon Theological College, Wheatley, Oxford.*
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1877. Woodward, T. Best, Esq. 3, *Abbey Terrace Malvern.*
1873. Wright, F. Esq. 68, *High Street, Kensington, S.W.*

- F** Wright, Francis Beresford, Esq. M.A. Cantab. J.P.
F.R.H.S. *Aldercar Hall, Langley Mill, Nottingham.*
- F** Wright, Rev. Henry, M.A. Oxon. Prebendary of St. Paul's. *Dec. 1880.*
- F** †Wright, J. Hornsby, Esq. 2, *Abbey Rd., Maida Hill, N.W.*
- F** Wyman, C. W. H. Esq. 103, *King Henry's Road, Primrose Hill, N.W.*

Y.

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- F** Young, Rev. Charles, M.A. Cantab. 36, *Sussex Square, Kemp-town, Brighton.*
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- F** Adam, Rev. Stephen C. M.A. Cantab. *St. Jude's Vicarage, Newbridge Crescent, Wolverhampton.*
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1879. *Barkly, Sir H. K.C.B. G.C.M.G. F.R.S. 1, *Bina Gardens, South Kensington, S.W.*
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SOCIETIES EXCHANGING TRANSACTIONS WITH THE INSTITUTE.

American Geographical Society.

American Philosophical Society.

Canadian Institute.

Geological Society.

Royal Asiatic Society (Bombay Branch).

Royal Colonial Institute.

Royal Geographical Society.

Royal Institution.

Royal Irish Academy.

Royal Society.

Royal United Service Institution.

Smithsonian Institution (Washington).

Society of Arts.

Society of Biblical Archaeology.

South Kensington Museum.

United States Government Geological and Geographical Survey.

Barrow Naturalists' Field Club.

Warwickshire Natural History Society and Naturalists' Field Club.

OBJECTS, CONSTITUTION, AND BYE-LAWS

OF

The Victoria Institute,

OR

Philosophical Society of Great Britain.

Adopted at the First Annual General Meeting of the Members and
Associates, held on Monday, May 27th, 1867.

(Revised at the Annual Meeting, June 15, 1874, and Jan. 4, 1875.)

§ I. Objects.

1. THE VICTORIA INSTITUTE, or PHILOSOPHICAL SOCIETY OF GREAT BRITAIN, is established for the purpose of promoting the following objects, viz.:—

First. To investigate fully and impartially the most important questions of Philosophy and Science, but more especially those that bear upon the great truths revealed in Holy Scripture ; with the view of reconciling any apparent discrepancies between Christianity and Science.

Second. To associate together men of Science and authors who have already been engaged in such investigations, and all others who may be interested in them, in order to strengthen their efforts by association ; and, by bringing together the results of such labours, after full discussion, in the printed transactions of an Institution : to give greater force and influence to proofs and arguments which might be little known, or even disregarded, if put forward merely by individuals.

Third. To consider the mutual bearings of the various scientific conclusions arrived at in the several distinct branches into which Science is now divided, in order to get rid of contradictions and conflicting hypotheses, and thus promote the real advancement of true Science; and to examine and discuss all supposed scientific results with reference to final causes, and the more comprehensive and fundamental principles of Philosophy proper, based upon faith in the existence of one Eternal God, who, in His wisdom, created all things very good.

Fourth. To publish Papers read before the Society in furtherance of the above objects, along with full reports of the discussions thereon, in the form of a Journal, or as the Transactions of the Institute.

Fifth. When subjects have been fully discussed, to make the results known by means of Lectures of a more popular kind, and to publish such Lectures.

Sixth. To publish English translations of important foreign works of real scientific and philosophical value, especially those bearing upon the relation between the Scriptures and Science; and to co-operate with other philosophical societies at home and abroad, which are now or may hereafter be formed, in the interest of Scriptural truth and of real science, and generally in furtherance of the objects of this Society.

Seventh. To found a Library and Reading Rooms for the use of the Members and Associates of the Institute, combining the principal advantages of a Literary Club.

§ II. *Constitution.*

1. The Society shall consist of Members and Associates, who in future shall be elected as hereinafter set forth.
2. The government of the Society shall be vested in a Council, to which members only shall be eligible, consisting of a President, two or more (not exceeding seven) Vice-presidents, a Treasurer, one or more Honorary Secretaries, and twelve

or more (not exceeding twenty-four) Ordinary Members of Council, who shall be elected at the Annual General Meeting of the Members and Associates of the Institute. But, in the interval between two annual meetings, vacancies in the Council may be filled up by the Council from among the Members of the Society; and the Members chosen as Trustees of the funds of the Institute shall be *ex officio* Members of Council.

3. Any person desirous of becoming a Member or Associate shall make application for admission by subscribing the Form A of the Appendix, which must be signed by two Members of the Institute, or by a Member of Council, recommending the candidate for admission as a Member; or by any one Member of the Institute, for admission as an Associate.

4. Upon such application being transmitted to one of the Secretaries, the candidate for admission may be elected by the Council, and enrolled as a Member or Associate of the Victoria Institute, in such manner as the Council may deem proper; having recourse to a ballot, if thought necessary, as regards the election of Members; in which case no person shall be considered as elected unless he have three-fourths of the votes in his favour.

5. Application for admission to join the Institute being thus made by subscribing Form A, as before prescribed, such application shall be considered as *ipso facto* pledging all who are thereupon admitted as Members or Associates to observe the Rules and Bye-Laws of the Society, and as indicative of their desire and intention to further its objects and interests; and it is also to be understood that only such as are professedly Christians are entitled to become *Members*.

6. Each Member shall pay an Entrance Fee of One Guinea and an Annual Contribution of Two Guineas. A Donation of Twenty Guineas shall constitute the donor a Life Member.

7. Each Associate shall pay an Annual Contribution of One Guinea. A donation of Ten Guineas shall constitute the donor a Life Associate.

8. The Annual Contributions shall be considered as due in advance on the 1st day of January in each year, and shall be

paid within three months after that date ; or, in the case of new admissions, within three months after election.

9. Any Member or Associate who contributes a donation in one sum of not less than Sixty Guineas to the funds of the Institute shall be enrolled as a Vice-Patron thereof, and will thus also become a Life Member or Life Associate, as the case may be.

10. Should any member of the Royal Family hereafter become the Patron, or a Vice-Patron, or Member of the Institute, the connection shall be regarded as purely Honorary ; and none of the Rules and Bye-Laws relating to donations, annual contributions, or obligations to serve in any office of the Society, shall be considered as applicable to such personages of Royal Blood.

11. Any Member or Associate may withdraw from the Society at any time, by signifying a desire to do so by letter, addressed to one of the Secretaries ; but such shall be liable for the contribution of the current year, and shall continue liable for the annual contribution, until all sums due to the Society from such Member or Associate shall have been paid, and all books or other property borrowed from the Society shall have been returned or replaced.

12. Should there appear cause, in the opinion of the Council, for the exclusion from the Society of any Member or Associate, a private intimation may be made by direction of the Council, in order to give such Member or Associate an opportunity of withdrawing from the Society ; but, if deemed necessary by the Council, a Special General Meeting of Members shall be called for the purpose of considering the propriety of expelling any such person : whereat, if eleven or more Members shall ballot, and a majority of those balloting shall vote that such person be expelled, he shall be expelled accordingly. One month's notice, at least, shall be given to the Members of any such Special General Meeting.

13. Non-resident Members and Associates, or others desirous of promoting the objects and interests of the Institute, may be elected by the Council to act as Corresponding Mem-

bers abroad, or as Honorary Local Secretaries, if within the United Kingdom, under such arrangements as the Council may deem advisable.

14. The whole property and effects of the Society shall be vested in two or more Trustees, who shall be chosen at a General Meeting of the Society.

14a. Special donations to the general fund, whether from Members, Associates, or others desirous of promoting the objects and interests of the Institute, shall be invested in the names of the Trustees.

14b. The Trustees are empowered to invest the Endowment Fund in other securities than Three per Cent. Annuities, such other securities being the Bonds of the Corporation of London, or Guaranteed Indian Railway Debentures, or Debenture Stocks.

14c. All moneys received on account of the Institute shall be duly paid to its credit at the Bankers, and all cheques shall be drawn, under authority of the Council, and shall be signed by the Honorary Treasurer and Honorary Secretary.

15. The accounts shall be audited annually, by a Committee, consisting of two Members,—one of whom may be on the Council,—to be elected at an Ordinary Meeting of the Society preceding the Anniversary Meeting. This Committee shall make a written Report to the Council at the first Meeting after such audit, and also to the Institute, upon the day of the Annual General Meeting,—stating the balance in the Treasurer's hands and the general state of the funds of the Institute.

16. Both Members and Associates shall have the right to be present to state their opinion, and to vote by show of hands at all General and Ordinary Meetings of the Society; but Members only shall be entitled to vote by ballot, when a ballot is taken in order to determine any question at a General Meeting.

§ III. *Bye-Laws* (Privileges).

1. A Member or Associate, when elected, shall be so informed by the Secretary in a printed copy of the letters, Form B, in the Appendix.
2. Members and Associates shall not be entitled to any privileges, or have the right to be present, or to vote at any of the Meetings of the Society, till they have paid the contributions due by them.
3. Annual subscriptions shall be considered as in arrear, if not paid on or before 31st March in each year, or within three months after election, as the case may be.
4. Should any annual subscription remain in arrear to the 30th June, or for six months after election, the Treasurer shall cause to be forwarded to the Member or Associate from whom the subscription is due, a letter, Form D, in the Appendix, unless such Member or Associate reside out of the United Kingdom; in which case the Form D shall not be sent unless the subscription continues unpaid till the 30th September.
5. If any arrears be not paid within twelve months, the Council shall use their discretion in erasing the name of the defaulter from the list of Members or Associates.
6. Members shall be entitled to introduce two Visitors at the Ordinary Meetings of the Society; and to have sent to them a copy of all the papers read before the Society, which may be printed in its Transactions * or otherwise, and of all other official documents which the Council may cause to be printed for the Society; they will also be entitled to a copy of all such translations of foreign works or other books as are published under the auspices of the Society in furtherance of Object 6 (§ I.).
7. Associates may introduce one visitor at the Ordinary Meetings, and shall be entitled to all the minor publications of the Society, and to a copy of its Transactions during the period

* And the Transactions issued in the years during which they have not subscribed may be purchased at half price.

of their being Associates, but not to the translations of foreign works or other books above referred to.* It shall, however, be competent to the Council of the Society, when its funds will admit of it, to issue the other publications of the Society to Associates, being ministers of religion, either gratuitously or at as small a charge as the Council may deem proper.

8. When it shall be found necessary to send the letter, Form D, to any Member or Associate who may be in arrear, the printed papers and other publications of the Society shall cease to be sent to such Member or Associate till the arrears are paid; and, until then, he shall not be allowed to attend any Meeting of the Society, nor have access to any public rooms which may be in its occupation.

9. The Library† shall be under the management and direction of the Council, who are empowered to designate such works as shall not be allowed to circulate.

10. Each Member‡ shall be allowed to borrow books from the Library, and to have not more than three volumes in his possession at the same time; pamphlets and periodical publications not to be kept above fourteen days, nor any other book above three weeks.

11. Members who may borrow books from the Library shall be answerable for the full value of any work that is lost or injured.

12. Periodical publications shall remain on the table for a month, other books for a fortnight, after they are received.

13. When a book or pamphlet is wanted, and has been the stipulated time in the possession of any Member, the Secretary shall request its return, and a fine of threepence a day shall be incurred for every day it may be detained, which fine shall commence on the third day after the transmission of the notice in the case of town Members, and after the sixth day in the case of country Members; and until the return of such works,

* These, as well as the Transactions issued in the years during which they have not subscribed, may be purchased at half price.

† For the use of the Members and Associates.—See 7th Object.

‡ Members only are allowed to take books away.

and the discharge of all fines incurred, no further issue of books shall be permitted to the Member applied to.

14. The books shall be ordered in for inspection at such times as the Council shall appoint, and a fine of half-a-crown shall be incurred for neglecting to send in books by the time required in the notice.

15. A Book shall lie on the Library table in which Members may insert, for the consideration of the Council, the titles of such works as they desire to be purchased for the Institute.

§ IV. Bye-Laws (General, Ordinary, and Intermediate Meetings).

1. A General Meeting of Members and Associates shall be held annually on May 24th (being Her Majesty's birthday, and the Society's anniversary), or on the Monday following, or on such other day as the Council may determine as most convenient, to receive the Report of the Council on the state of the Society, and to deliberate thereon; and to discuss and determine such matters as may be brought forward relative to the affairs of the Society; also, to elect the Council and Officers for the ensuing year.

2. The Council shall call a Special General Meeting of the Members and Associates, when it seems to them necessary, or when required to do so by requisition, signed by not less than ten Members and Associates, specifying the question intended to be submitted to such Meeting. Two weeks' notice must be given of any such Special General Meeting; and only the subjects of which notice has been given shall be discussed thereat.

3. The Ordinary Meetings of the Society shall usually be held on the first and the Intermediate Meetings on the third Monday evenings in each month, from November to June inclusive, or on such other evenings as the Council may determine to be convenient; and a printed card of the Meetings for each Session shall be forwarded to each Member and Associate.

4. At the Ordinary and Intermediate Meetings the order of

proceeding shall be as follows:—The President, or one of the Vice-Presidents, or a Member of the Council, shall take the chair at 8 o'clock precisely, the minutes of the last Ordinary or Intermediate Meeting shall be read aloud by one of the Secretaries, and, if found correct, shall be signed by the Chairman; the names of new Members and Associates shall be read; the presents made to the Society since their last Meeting shall be announced; and any other communications which the Council think desirable shall be made to the Meeting. After which, the Paper or Papers intended for the evening's discussion shall be announced and read, and the persons present shall be invited by the Chairman to make any observations thereon which they may wish to offer.

The claims of Members and Associates to take part in a discussion are prior to those of Visitors. The latter, when desiring to speak upon any Paper, must first send their cards to the Chairman and ask permission (unless they have been specially invited by the Council "to attend, and join in considering the subject before the Meeting," or are called upon by the Chairman). 1875.

5. The Papers read before the Society, and the discussions thereon, fully reported, shall be printed by order of the Council; or, if not, the Council shall, if they see fit, state the grounds upon which this Rule has been departed from, in the printed Journal or Transactions of the Society.

6. The Council may at their discretion authorize Papers of a general kind to be read at any of the Ordinary or Intermediate Meetings, either as introductory lectures upon subjects proper to be afterwards discussed, or as the results of discussions which have taken place, in furtherance of the 5th Object of the Society (§ I.).

7. With respect to Intermediate Meetings, the Papers read at which are not necessarily printed nor the discussions reported,* the Council, at its discretion, may request any lecturer or author of a paper to be read thereat, previously to submit an outline of the proposed method of treating his subject.

* So arranged when the "Intermediate Meetings" were commenced, 16th January, 1871.

8. At the Ordinary or Intermediate Meetings no question relating to the Rules or General Management of the affairs of the Society shall be introduced, discussed, or determined ; but

At the First Ordinary Meeting in each month, Members having notices of motion on matters of detail relating to the Institute, shall give such notices in writing, after the Minutes have been read and confirmed, and any announcements in regard to elections have been made, and at no other time. Each notice shall be signed by its mover and seconder. Such notices will be fixed up in the reading-room, and considered at the following Ordinary Meeting, provided the mover be then present to explain his views ; the discussion of the same to terminate not later than half-past 8 o'clock. For these purposes all Ordinary Meetings shall be considered Special.

§ V. *Bye-Laws (Council Meetings).*

1. The Council shall meet at least once every month from November to June inclusive, or at any other time and on such days as they may deem expedient. The President, or any three Members of the Council, may at any time call a Special Meeting, to which the whole Council shall be summoned.

2. At Council Meetings three shall be a quorum ; the decision of the majority shall be considered as the decision of the Meeting, and the Chairman shall have a casting vote.

3. Minutes of the proceedings shall be taken by one of the Secretaries, or, in case of his absence, by some other Member present, whom the Chairman may appoint ; which minutes shall afterwards be entered in a minute-book kept for that purpose, and read at the next Meeting of the Council, when, if found correct, they shall be signed by the Chairman.

§ VI. *Bye-Laws (Papers).*

1. Papers presented to be read before the Society shall, when read, be considered as the property of the Society, unless there shall have been any previous engagement with its author to the contrary ; and the Council may cause the same to be published in any way and at any time they may think proper after having been read. If a Paper be not read, it shall be returned to the

author; and, if a Paper be not published within a reasonable time after having been read, the author shall be entitled himself to publish it, and he may borrow it for that purpose.

2. When a Paper is sent to the Society for the purpose of being read, it shall be laid before the Council, who shall refer it to two of that body, or of the other Members or Associates of the Society whom they may select, for their opinions as to the character of the Paper and its fitness or otherwise for being read before the Society, which they shall state as briefly as may be, in writing, along with the grounds of their respective opinions. Should one of such opinions be adverse to the Paper and against its being read before the Society, then it shall be referred to some other referee, who is unaware of the opinion already pronounced upon the Paper, in order that he may state his opinion upon it in like manner. Should this opinion be adverse to the Paper, the Council shall then consult and decide whether the Paper shall be rejected or read; and, if rejected, the Paper shall be returned to the author with an intimation of the purport of the adverse opinions which have been given with respect to it; but the names of the referees are not to be communicated to him, unless with their consent or by order of the Council. All such references and communications are to be regarded as confidential, except in so far as the Council may please to direct otherwise.

3. The Council may authorize Papers to be read without such previous reference for an opinion thereon; and when a Paper has been referred, and the opinion is in favour of its being read in whole or in part, the Council shall then cause it to be placed in the List of Papers to be so read accordingly, and the author shall receive due notice of the evening fixed for its reading.

4. The authors of Papers read before the Society shall, if they desire it, be presented with twenty-five separate copies of their Paper, with the discussion thereon, or with such other number as may be determined upon by the Council.

§ VII. *Bye-Laws* (General).

1. The government of the Society and the management of its concerns are entrusted to the Council, subject to no other restrictions than are herein imposed, and to no other interference than may arise from the acts of Members in General Meeting assembled.

2. With respect to the duties of the President, Vice-Presidents, and other Officers and Members of Council, and any other matters not herein specially provided for, the Council may make such regulations and arrangements as they deem proper, and as shall appear to them most conducive to the good government and management of the Society, and the promotion of its objects. And the Council may hire apartments, and appoint persons not being Members of the Council, nor Members or Associates of the Institute, to be salaried officers, clerks, or servants, for carrying on the necessary business of the Society ; and may allow them respectively such salaries, gratuities, and privileges, as to them, the Council, may seem proper ; and they may suspend any such officer, clerk, or servant from his office and duties, whenever there shall seem to them occasion ; provided always, that every such appointment or suspension shall be reported by the Council to the next ensuing General Meeting of the Members, to be then confirmed or otherwise, as such Meeting may think fit.

FORM A.

FORM OF APPLICATION for the Admission of Vice-Patrons, Members, or Associates of
the VICTORIA INSTITUTE.

[Date]

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I hereby desire to be enrolled a *

INSTITUTE, OR PHILOSOPHICAL SOCIETY OF GREAT BRITAIN.

<p>* Here insert Vice-Patron, <i>or</i> Member, <i>or</i> Life Member, <i>or</i> Associate, <i>or</i> Life Associate.</p>	<p>Candidate's ordinary Signature, and full name, if necessary.</p> <p>Title, Profession, University degree, &c., or other distinction.</p> <p>Address</p> <p>If an Author, the name of the Candidate's works may be here stated.</p>	<p>To be signed by a Member or Associate or a Member of Council, or an Honorary Officer of the Institute, in the case of a Member; or by any one Member or Associate in the case of an Associate.</p>
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FORM B.

SIR,

18 .

I have the pleasure to inform you, with reference to your application dated the _____, that you have duly been elected a _____ of the VICTORIA INSTITUTE, OR PHILOSOPHICAL SOCIETY OF GREAT BRITAIN.

I have the honour to be, Sir,
Your faithful Servant,

To _____

Hon. Sec.

FORM C.

(Bankers) Messrs. _____

* Please pay Messrs. RANSOM, BOUVERIE, & Co. my Annual Contribution of Two GUINEAS to the VICTORIA INSTITUTE, due on the 1st of January, 188_____, and the same amount on that day in every succeeding year, until further notice.

I am,
Your obedient Servant,

188 .

If this Form be used, please add your Signature, Banker's Name, and the Date, and return it to the Office, 7, Adelphi Terrace. Receipt-stamp required.

* The above is the form for Members. The form for Associates is the same, except that the Subscription stands as "ONE GUINEA."

FORM D.

SIR,

18 .

I am directed by the Council of the VICTORIA INSTITUTE to remind you that the Annual Contribution due by you to the Society for the year _____ is now six months in arrear; and I have to call attention to the Bye-Laws of the Institute, § III., ¶ 4 and 8, and to request you to remit to me the amount due (viz. £_____) by Post-office order or otherwise, at your earliest convenience.

I have the honour to be, Sir,
Your faithful Servant,

To _____

Treasurer.

FORM E.

FORM OF BEQUEST.

I give and bequeath to the Trustees or Trustee for the time being of THE VICTORIA INSTITUTE, OR PHILOSOPHICAL SOCIETY OF GREAT BRITAIN, to be applied by them or him for the purposes of the said Society, the sum of £ , such sum to be wholly paid out of such part of my personal estate as may be lawfully applied to the purposes of charity, and in priority to all other legacies. And I declare that the receipt of the Trustees or Trustee for the time being of the said Society shall be a good discharge to my Executors for the said legacy.

The Journal is arranged so as to secure its special usefulness to Country and Foreign Members and Associates (who form two-thirds of the Institute).

The Journal contains the Papers read at the Meetings, and the Discussions thereon.

Before they are published in the Journal, the papers themselves, and the discussions, are revised and corrected by their Authors, and MS. comments and supplementary remarks are added, which have been sent in by those Home and Foreign Members to whom, as being specially qualified to pronounce an opinion upon the respective subjects, proof copies of the Papers have been submitted for consideration. These arrangements, which cannot but add to the value of the Journal, are carried out with a view to the advantage of all, especially Country and Foreign Members, who thus find in the Journal much valuable matter, in addition to that which had come before those actually present at the Meetings.

PROGRESS OF THE INSTITUTE.

Members and Associates on 1st January, 1871, 203. Joined since.—In 1871, 91;—1872, 109;—1873, 110;—1874, 111;—1875, 115;—1876, 107;—1877, 100;—1878, 101;—1879, 105;—1880, 104 (22 Town, 38 Country, 44 Foreign and Colonial).

THE JOURNAL OF THE TRANSACTIONS.

Since the Inauguration of the Society, on the 24th of May, 1866, the following Papers have been read:—The Quarterly Parts of the Journal are indicated by the numbers prefixed. (*The volumes are sold at One Guinea to Non-Members; Half-a-Guinea to Members and Associates.*)

FIRST SERIES, VOL. I TO 6.

VOL. I.

1. A Sketch of the Existing Relations between Scripture and Science. By the late **GEORGE WARINGTON, Esq., F.C.S.**
2. On the Difference in Scope between Scripture and Science. By the late **C. MOUNTFORD BURNETT, Esq., M.D.**, Vice-President V.I.
On Comparative Philology. By the Rev. **ROBINSON THORNTON, D.D.**, Vice-President V.I.
On the Various Theories of Man's Past and Present Condition. By the late **JAMES REDDIE, Esq., Hon. Sec. V.I.**
3. On the Language of Gesticulation and Origin of Speech. By Professor **J. R. YOUNG**.
On Miracles: their Compatibility with Philosophical Principles. By the Rev. **W. W. ENGLISH, M.A.**
Thoughts on Miracles. By the late **E. B. PENNY, Esq.**
On the General Character of Geological Formations. By the late **E. HOPKINS, Esq., C.E.**
4. On the Past and Present Relations of Geological Science to the Sacred Scriptures. By the Rev. Professor **JOHN KIRK**.
On the Lessons taught us by Geology in relation to God. Rev. **J. BRODIE, M.A.**
On the Mutual Helpfulness of Theology and Natural Science. By Dr. **GLADSTONE, F.R.S.**
On Falling Stars and Meteorites. By the late Rev. **W. MITCHELL, M.A.**, Vice-President V.I.
(The above Papers, with the Discussions thereon, and with "Scientia Scientiarum: being some Account of the Origin and Objects of the Victoria Institute," with the Reports of the Provisional Proceedings, and the Inaugural Address by the late Rev. Walter Mitchell, M.A., Vice-President, form Volume I. of the "Journal."

VOL. II.

5. On the Terrestrial Changes and Probable Ages of the Continents, founded upon Astronomical Data and Geological Facts. By the late **EVAN HOPKINS, Esq., C.E., F.G.S.**
On the Credibility of Darwinism. By the late **GEORGE WARINGTON, Esq., F.C.S.**
6. On the Credibility of Darwinism. By the late **JAMES REDDIE, Esq., Hon. Sec. V.I.**
On Utilitarianism. By the late **JAMES REDDIE, Esq., Hon. Sec. V.I.**
On the Logic of Scepticism. By the Rev. **ROBINSON THORNTON, D.D., V.P.**
Annual Address (On the Institute's Work). By the late **JAMES REDDIE, Esq., Hon. Sec. V.I.**
7. On the Relations of Metaphysical and Physical Science to the Christian Doctrine of Prayer. By the Rev. Professor **JOHN KIRK**.
On Geological Chronology, and the Cogency of the Arguments by which some Scientific Doctrines are supported. (In reply to Professor Huxley's Address delivered at Sion College on 21st Nov., 1867.) By the late **J. REDDIE, Esq., Hon. Sec. V.I. (1867-68).**
8. On the Geometrical Isomorphism of Crystals, and the Derivation of all other Forms from those of the Cubical System. (6 Plates.) By the late Rev. **W. MITCHELL, M.A., V.P.**

VOL. III.

9. On the Antiquity of Civilization. By the Right Rev. Bishop **TITCOMB, D.D.**
On Life, with some Observations on its Origin. By **J. H. WHEATLEY, Esq., Ph.D.**
On the Unphilosophical Character of some Objections to the Divine Inspiration of Scripture. By the late Rev. **WALTER MITCHELL, M.A.**, Vice-President V.I.
On Comparative Psychology. By **E. J. MORSEHEAD, Esq., Hon. For. Sec. V.I.**
10. On Theology as a Science. By the Rev. **A. DE LA MARE, M.A.**
On the Immediate Derivation of Science from the Great First Cause. By **R. LAMING, Esq.**
On some of the Philosophical Principles contained in Mr. Buckle's "History of Civilization," in reference to the Laws of the Moral and Religious Developments of Man. By the Rev. Prebendary **C. A. ROW, M.A.**

- On the Nature of Human Language, the Necessities of Scientific Phraseology, and the Application of the Principles of both to the Interpretation of Holy Scripture. By the Rev. J. BAYLEE, D.D.
11. On the Common Origin of the American Races with those of the Old World. By the Right Rev. Bishop TITCOMB, D.D.
- On the Simplification of First Principles in Physical Science. By the late C. BROOKES, Esq., F.R.S., &c.
- On the Biblical Cosmogony scientifically considered. By late G. WARINGTON, Esq., F.C.S.
- On Ethical Philosophy. By the Rev. W. W. ENGLISH, M.A.
12. On some Uses of Sacred Primeval History. By the late D. McCUSAULD, Esq., Q.C., LL.D.
- On the Relation of Reason to Philosophy, Theology, and Revelation. By the Rev. Prebendary C. A. Row, M.A.

VOL. IV.

13. Analysis of Human Responsibility. By the Rev. Prebendary IRONS, D.D. (And part 16.)
On the Doctrine of Creation according to Darwin, Agassiz, and Moses. By Prof. KIRK.
14. On the Noachian Deluge. By the Rev. M. DAVISON.
On Life—Its Origin. By J. H. WHEATLEY, Esq., Ph.D.
15. On Man's Place in Creation. By the late Professor MACDONALD, M.D.
On More than One Universal Deluge recorded in Scripture. By Rev. H. MOULE, M.A.
On Certain Analogies between the Methods of Deity in Nature and Revelation. By the Rev. G. HENSLOW, M.A., F.L.S.
16. On the Respective Provinces of the Observer and the Reasoner in Scientific Investigation. By the Rev. EDWARD GARRETT, M.A.
On the Credulity of Scepticism. By the Rev. R. THORNTON, D.D., V.P.
On Current Physical Astronomy. By the late J. REDDIE, Esq., Hon. Sec. V.I.
Analysis of Human Responsibility. By Rev. Preb. IRONS, D.D. (See part 13.) Concluded.

VOL. V.

17. On the Origin of the Negro. By the Right Rev. Bishop TITCOMB, D.D.
On the Testimony of Philosophy to Christianity as a Moral and Spiritual Revelation. By the Rev. Prebendary C. A. Row, M.A.
18. On the Numerical System of the Old Testament. By the Rev. Dr. THORNTON, V.P.
On Spontaneous Generation; or, the Problem of Life. By the Rev. Professor KIRK.
A Demonstration of the Existence of God. By the Rev. J. MCCANN, D.D.
Why Man must Believe in God. By the late JAMES REDDIE, Esq., Hon. Sec. V.I.
19. On Geological Proofs of Divine Action. By S. R. PATTISON, Esq., F.G.S.
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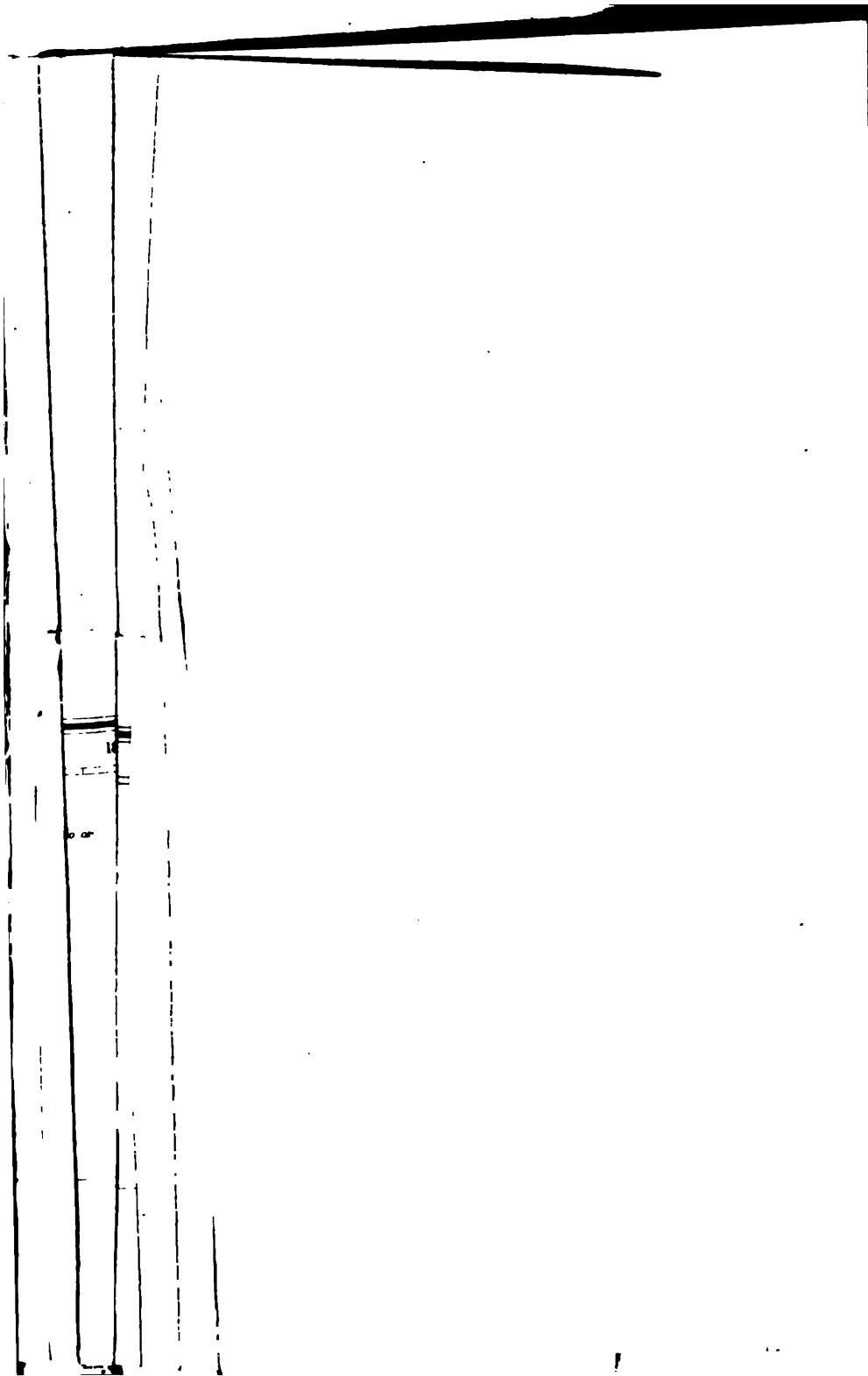
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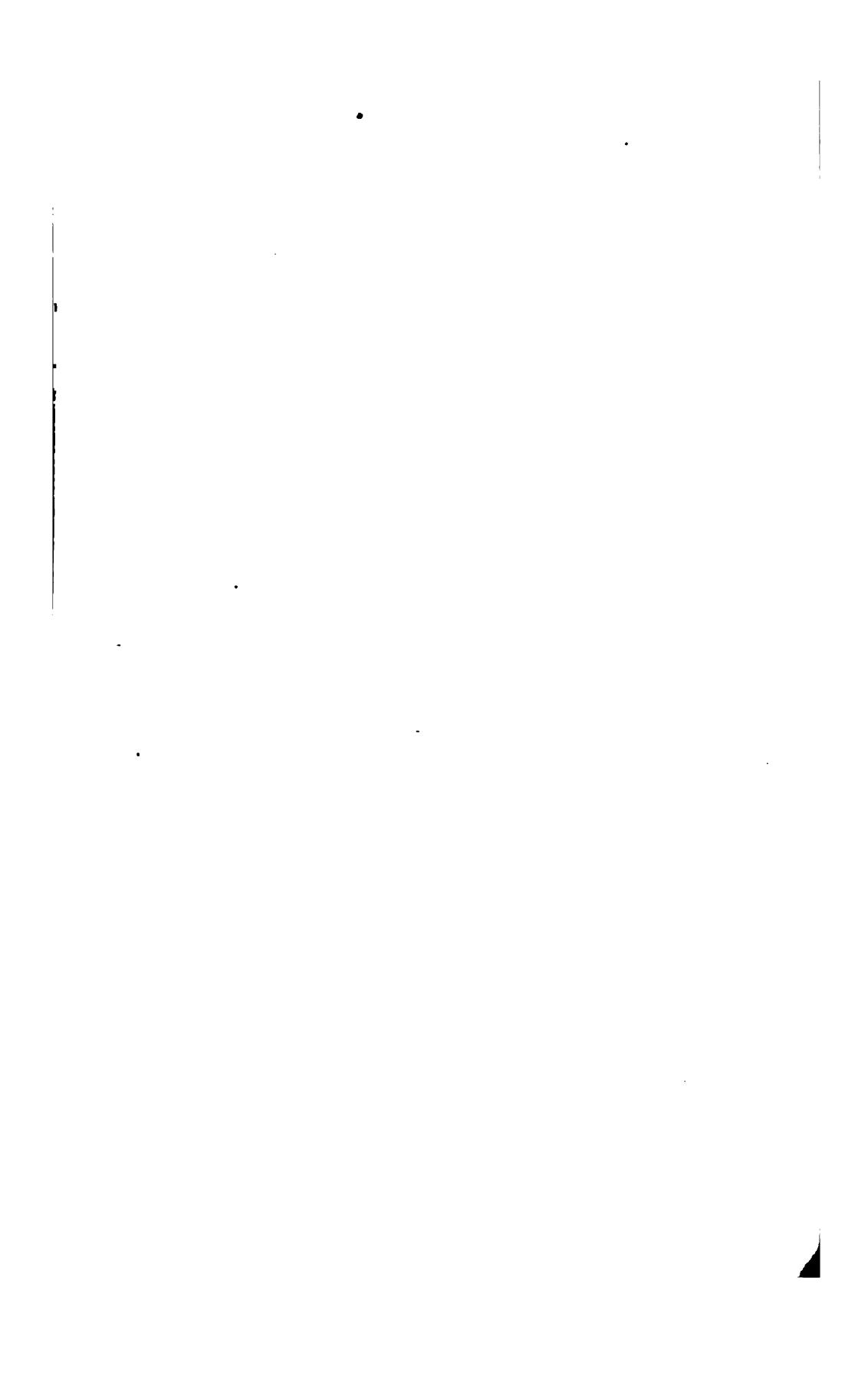
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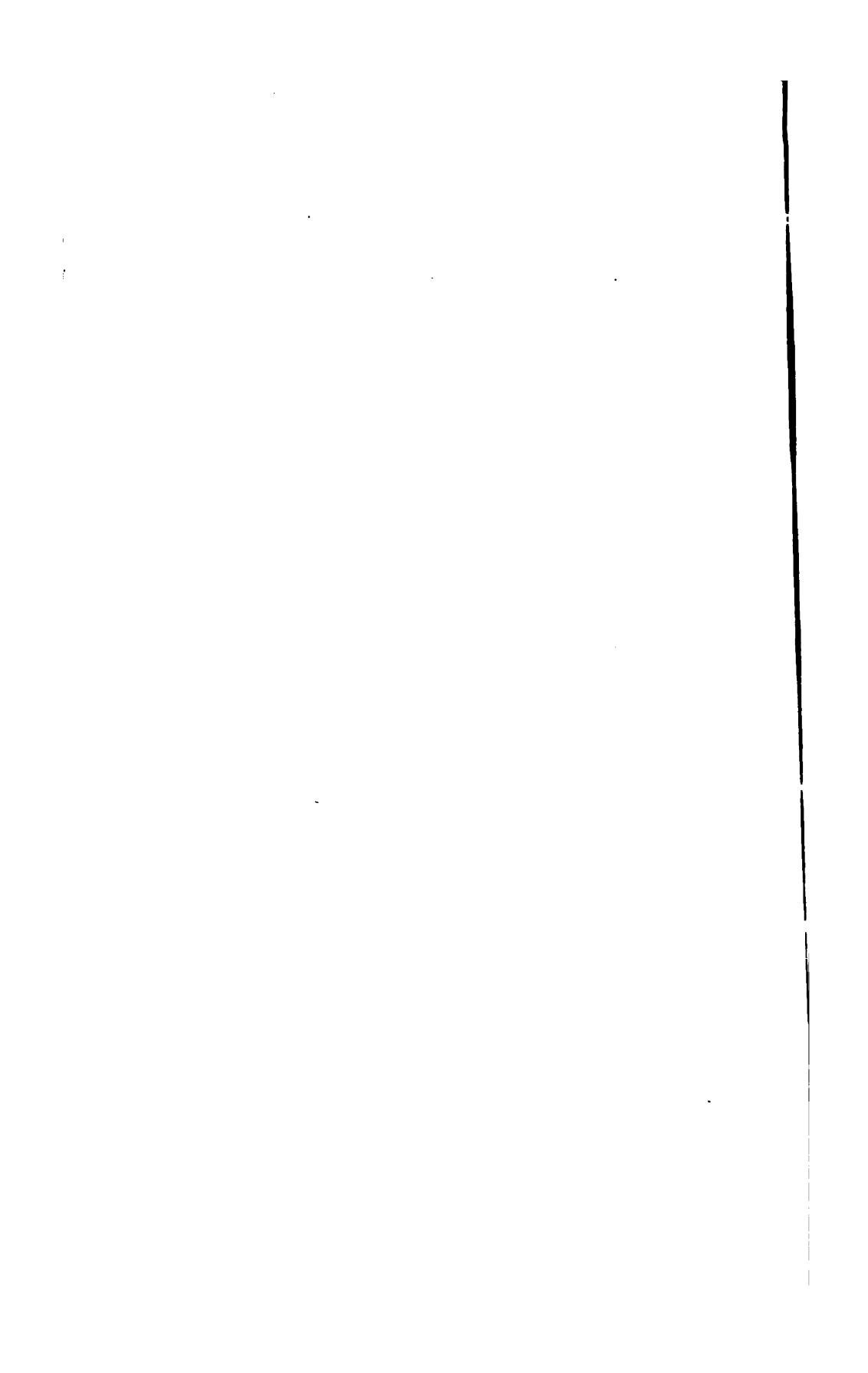
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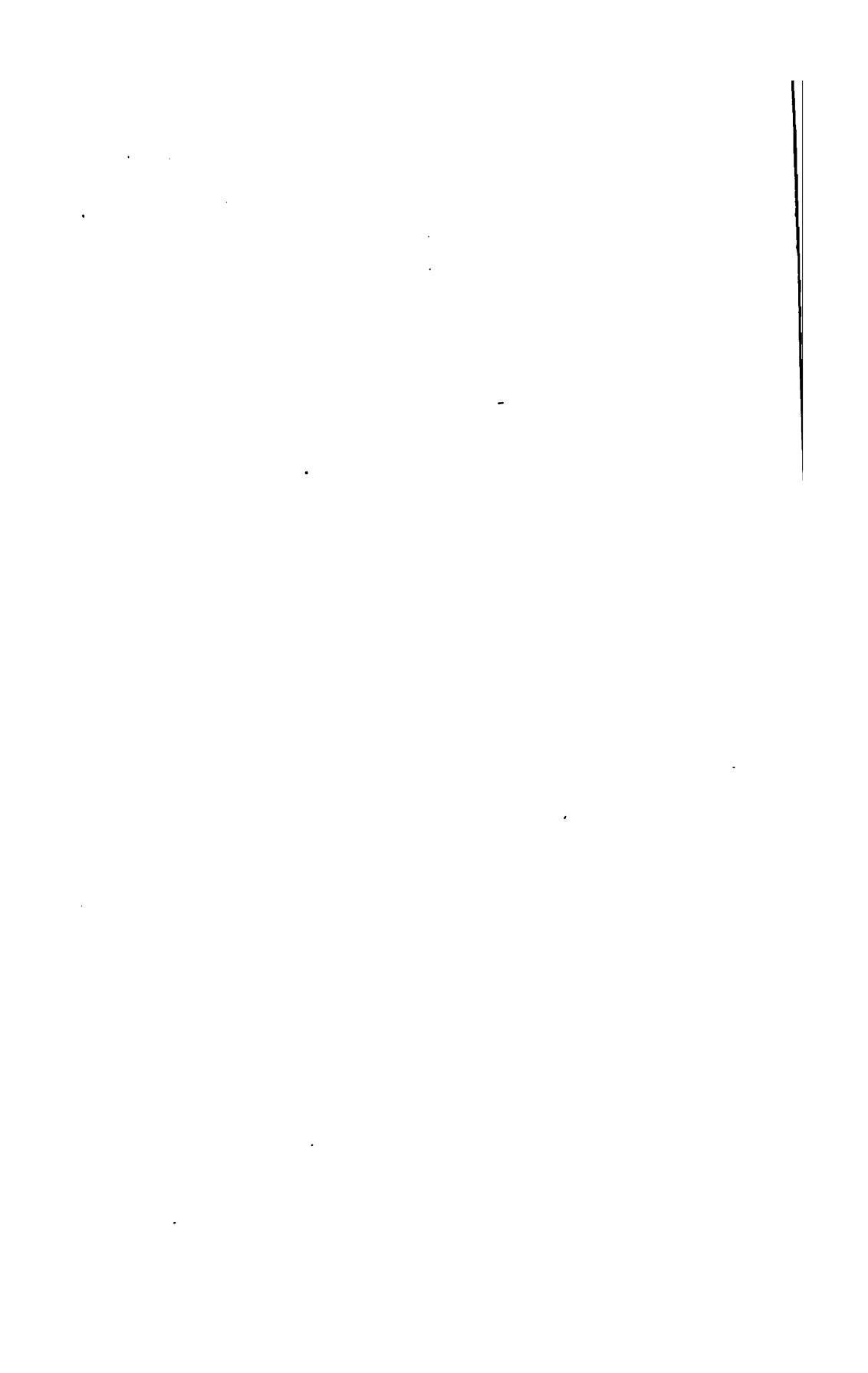
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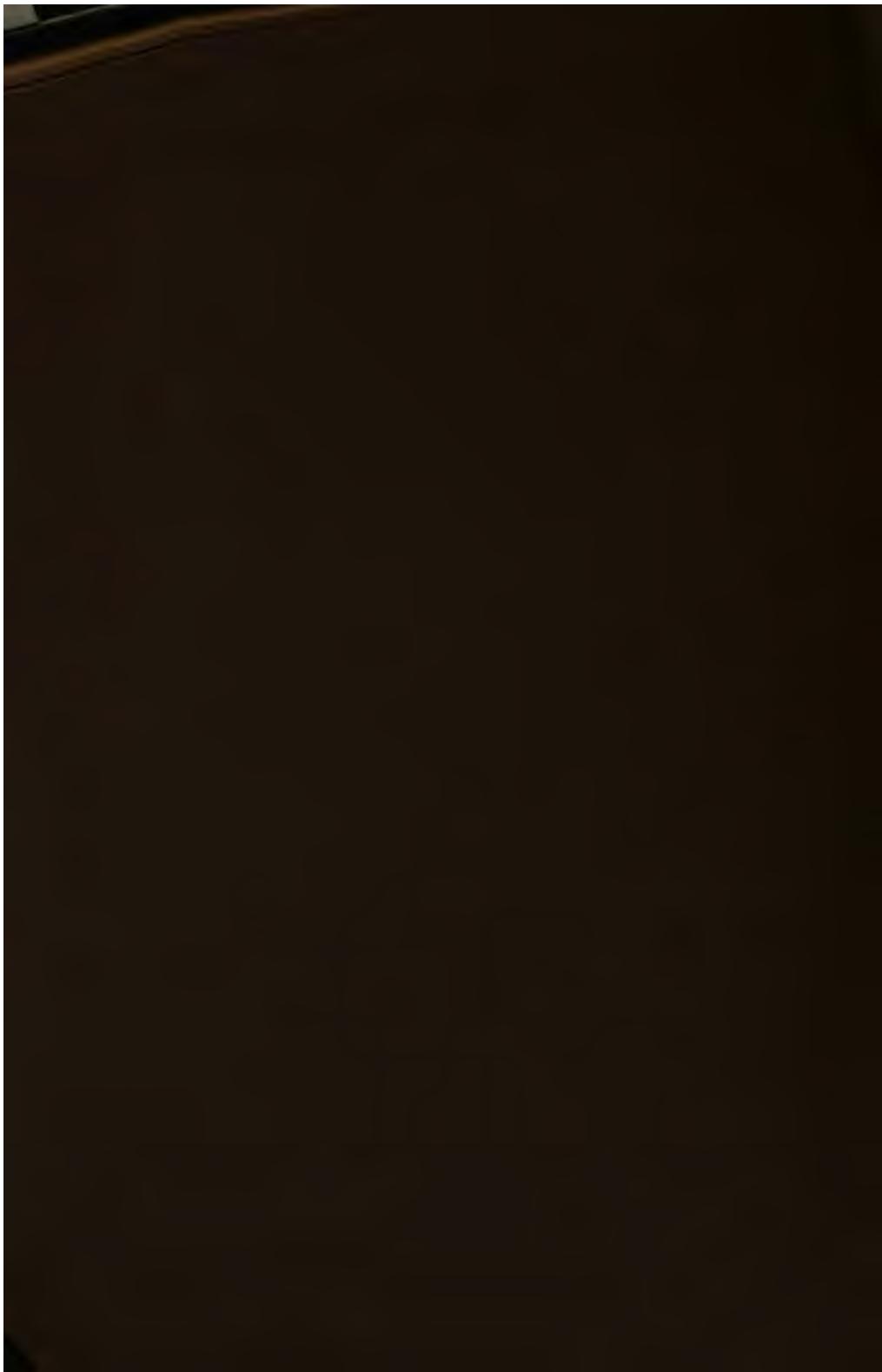












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